

REVIEW OF *POLYRHACHIS* (*CYRTOMYRMA*) FOREL (HYMENOPTERA: FORMICIDAE: FORMICINAE) OF AUSTRALIA, BORNEO, NEW GUINEA AND THE SOLOMON ISLANDS WITH DESCRIPTIONS OF NEW SPECIES

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Thirty new species of the subgenus *Cyrtomyrma* are described, including nine from Australia: *P. abbreviata* sp. nov., *P. brevinoda* sp. nov., *P. decumbens* sp. nov., *P. delecta* sp. nov., *P. expressa* sp. nov., *P. hoelldobleri* sp. nov., *P. monteithi* sp. nov., *P. robsoni* sp. nov. and *P. rutila* sp. nov.; six from Borneo: *P. achterbergi* sp. nov., *P. bruehli* sp. nov., *P. danum* sp. nov., *P. lepida* sp. nov., *P. sulang* sp. nov. and *P. widodoi* sp. nov.; twelve from New Guinea: *P. aporema* sp. nov., *P. barryi* sp. nov., *P. conspicua* sp. nov., *P. dorsena* sp. nov., *P. liybosia* sp. nov., *P. inducta* sp. nov., *P. inflata* sp. nov., *P. integra* sp. nov., *P. kyawthani* sp. nov., *P. sedlaceki* sp. nov., *P. strumosa* sp. nov. and *P. tuberosa* sp. nov., and three from the Solomon Islands: *P. pacifica* sp. nov., *P. setosa* sp. nov. and *P. undulata* sp. nov. Seven subspecies, *P. laevissima ariensis* Viehmeyer, *P. rastellata celebensis* Viehmeyer, *P. rastellata corporaali* Santsehi, *P. rastellata fulakora* Mann, *P. rastellata johnsoni* Mann, *P. rastellata nomo* Donisthorpe and *P. rastellata semiinermis* Donisthorpe are raised to specific status. A neotype of *P. australis* is designated. Two species, *P. rastellata* (Latreille) and *P. debilis* Emery, previously listed from Australia, apparently do not occur there. Checklists and identification keys to the *Cyrtomyrma* species of Australia, Borneo, New Guinea and the Solomon Islands are provided. All the new species are illustrated and notes on their distribution and nesting habits provided. □ *Hymenoptera, Formicidae, Polyrhachis, Cyrtomyrma, new species, identification keys, distribution.*

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Cyrtomyrma is one of the relatively well defined subgenera of *Polyrhachis*. However, it is a taxonomically difficult group with many very similar species that are frequently confused and misidentified. This study began in 2001 as a review of the Australian species of *Cyrtomyrma*, primarily to provide taxonomic support for studies on their nesting habits being conducted by Simon Robson at James Cook University (Robson & Kohout, 2005). Examination of Australian material revealed several new species, particularly in the Wet Tropics region of north Queensland (Kohout, 2000). However, because of the close affinities of the Australian fauna with that of South East Asia, it soon became apparent that it was necessary to examine material from Borneo, Indonesia, New Guinea and the Solomon Islands. This resulted in the recognition of twenty-one extralimital new species which are related to Australian species, or are otherwise interesting. The close affinity between the Australian *Cyrtomyrma* fauna and that of Indonesia, New Guinea and the Solomon Islands is evident in a number of pairs of very similar species, for example (Australian species listed first): *P. australis* Mayr – *P. mondooi* Donisthorpe (New Guinea); *P. decumbens* sp. nov.

– *P. nomo* Donisthorpe (New Guinea); *P. delecta* sp. nov. – *P. euryala* Fr. Smith (Indonesia); and *P. expressa* sp. nov. – *P. emeryana* Mann (Solomon Islands). The characters separating the species of each pair are constant, and I prefer to treat them as distinct species rather than isolated populations of the same species.

With a highly convex, dome-shaped and mostly very finely sculptured mesosoma, the majority of *Cyrtomyrma* species bear a superficial resemblance to some members of the *P. mucronata*-group of the subgenus *Myrmhopla* Forel. However, virtually all *Cyrtomyrma* species have a distinct posterolateral carina separating the gena from the ventral parts of the head, a character lacking in all known species of the *P. mucronata*-group. The two groups also differ in the configuration of the petiole. In *Cyrtomyrma* the petiole is scale-like and usually armed with four (or more rarely two) teeth or spines. In contrast, the petiole in *P. mucronata*-group species is columnar and armed with two, more-or-less horizontal, posteriorly directed spines that usually curve to the shape of the gaster. In addition, the petiole often bears a pair of short, intercalary teeth.

The pupae also differ between the two groups, being naked in all known *Cyrtomyrma* species (a character shared with members of the subgenus *Myrmatopa* Forel), and enclosed within cocoons in *P. mucronata*-group species. The species of both groups have similar nesting habits, building nests of silk and vegetation debris upon the leaves of various plants.

METHODS

Unlike other *Polyrhachis* ants, the cuticle of *Cyrtomyrma* species appears to be very thin and the body is highly prone to fracturing in preserved specimens. Damage to many specimens, including numerous types, is so excessive that they could not be confidently measured or identified. The same problem was encountered during specimen preparation for scanning electron microscopy. In spite of specimens being 'critical point' dried, the head, mesosoma and gaster of many cracked in the vacuum chamber during the coating process. However, where the damage did not affect the taxonomically important parts of the body, or the general appearance of the ant was not significantly distorted, such specimens were still used for illustrations.

Publication dates and the spelling of species epithets and authors' names follow Bolton (1995), except for the name of W. Karawajew, where the spelling used by the author himself (e.g. 1927 *etc*) has been followed. Where a holotype specimen is mentioned as 'unique', this infers that it was the only specimen available for description and no syntype or paratype specimens are known to exist. This study is principally based on the worker caste but notes are provided on associated queens.

The localities at which ants were collected by the Bishop Museum's collectors were checked against that institution's list of New Guinean localities (BPFM, 1966, unpublished). In some cases the latitude and longitude co-ordinates, or altitude, are only roughly approximate. The use of the words "Borneo", "New Guinea" or "Bismarck Archipelago" alone indicate the delimitation of these regions in a biogeographic sense regardless of current political boundaries. Similarly, the fauna of Bougainville Island is treated with that of the Solomons. Collectively they share a relatively homogenous group of species that is rather distinct from that of the Bismarck Archipelago and New Guinea.

ILLUSTRATIONS. Scanning electron micrographs were prepared with a Hitachi S-530 SEM, using gold coated specimens. Unless otherwise indicated, they represent specially selected paratypes (often from the same nest series as the holotype) of new species or critically compared specimens (mostly from type localities) of previously described species. Because fracturing repeatedly occurred in specimens of several species, the SEM micrographs are sometimes complemented or substituted by digital images. These were also used to illustrate types of previously described species and of some new species where insufficient material prohibited the use of specimens for coating. Digital photographs were prepared using a ProgRes 3012 scanning digital camera (Jenoptik) attached to Leica MZ16 stereomicroscope. All digital images were processed using Auto-Montage (Syncroscopy, Division of Synoptics Ltd, USA) software.

STANDARD MEASUREMENTS AND INDICES. Measurements and indices follow those of Kohout (1990: 499): TL, Total length (the necessarily composite measurement of the outstretched length of the entire ant measured in profile); HL, head length (the maximum measurable length of the head in perfect full face view, measured from the anterior-most point of the clypeal border or teeth, to the posterior-most point of the occipital margin); HW, head width (width of the head in perfect full face view, measured immediately in front of the eyes); CI, cephalic index ($HW \times 100/HL$); SL, scape length (excluding the condyle); SI, scape index ($SL \times 100/HW$); PW, pronotal width (greatest width of the pronotal dorsum); MTL, metathoracic tibial length (maximum measurable length of the tibia of the hind leg). All measurements were taken using a Zeiss SR stereomicroscope with an eyepiece graticule calibrated against a stage micrometer. All measurements are expressed in millimetres (mm).

ABBREVIATIONS. *Collectors.* BBL, B.B. Lowery; CJB, C.J. Burwell; DJC, D.J. Cook; GBM, G.B. Monteith; JLG, J.L. Gressitt; JPH, J. & P. Hasenpuseh; RJK, R.J. Kohout; RWT, R.W. Taylor; SKR, S.K. Robson; TCM, T.C. Maa.

General. Bch, Beach; Ck, Creek; FP, Forest Park; Hmsd, Homestead; I., Island; Is, Islands; Mt, Mount; Mtn, Mountain; Mts, Mountains; NP, National Park; Pen., Peninsula; Pltn, Plantation; R., River; Ra., Range; Rd, Road; rf., rainforest; SF, State Forest; Stn, Station; Tld, Tableland; w, worker/s; x-ing, crossing.

Institutions (with names of cooperating curators).

AMNH, American Museum of Natural History, New York, U.S.A (Dr J. M. Carpenter); ANIC, Australian National Insect Collection, Canberra, Australia (Drs S.O. Shattuck, R.W. Taylor); BMNH - The Natural History Museum, London, U.K. (Dr Barry Bolton); BPBM - Bernice P. Bishop Museum, Honolulu, U.S.A. (K.T. Arakaki); IZUW - Institute of Zoology, University of Würzburg, Germany (Dr B. Hölldobler); JCUT - James Cook University, Townsville, Australia (Dr S.K. Robson); MCSN - Museo Civico di Storia Naturale 'Giacommo Doria', Genova, Italy (Drs R. Poggi, V. Raineri); MCZC - Museum of Comparative Zoology, Harvard University, Cambridge, U.S.A. (Dr S. Cover); MHNG - Muséum d'Histoire Naturelle, Geneva, Switzerland (Drs C. Besuchet, I. Löbl, B. Merz); MLAC - Natural History Museum of Los Angeles County, Los Angeles, U.S.A. (Dr R.R. Snelling); MNHN - Muséum National d'Histoire Naturelle, Paris, France (Dr J. Casevitz Weulersse); MNHU - Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Dr F. Koeh, Ms A. Kleine-Möllhoff); NHMB - Naturhistorisches Museum, Basel, Switzerland (Drs M. Braneucci, D.H. Burckhardt); NHMW - Naturhistorisches Museum, Wien, Austria (Drs M. Fischer, S. Schödl); NMNH - National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A. (Dr T.R. Schultz); NNML - Nationaal Natuurhistorisch Museum, Leiden, The Netherlands (Dr Ing. C. van Achterberg); NRMS - Naturhistoriska Riksmuseet Stockholm, Sweden (Dr K-J Hedquist, F. Ronquist, B. Viklund); OXUM - Hope Entomological Collections, University Museum, Oxford, U.K. (Dr C. O'Toole); QM - Queensland Museum, Brisbane, Australia (Drs C.J. Burwell, G.B. Monteith); SNSD - Staatliche Naturhistorische Sammlungen, Museum für Tierkunde, Dresden, Germany (Drs R. Emmrich, U. Kallweit); UCDC - University of California, Davis, USA (Dr P. Ward); ITBC - Institute for Tropical Biology and Conservation, Kota Kinabalu, East Malaysia (Dr Maryati Mohamed).

SYSTEMATICS

Genus *Polyrhachis* Fr. Smith, 1857

Polyrhachis Fr. Smith, 1857: 58. Type species: *Formica bihamata* Drury, 1773 by original designation.

Subgenus *Cyrtomyrma* Forel, 1915

Cyrtomyrma Forel, 1915: 107 (as subgenus of *Polyrhachis* Fr. Smith); Emery, 1925: 207 (diagnosis); Donisthorpe,

1938: 246 (revision); Dorow, 1995: 21; Bolton 1995: 26. Type species: *Formica rastellata* Latreille, 1802 by original designation.

TAXONOMIC HISTORY

In 1867 Mayr published the first attempt to subdivide the genus *Polyrhachis*. He established six groups called 'turmae' which he later (1879) renamed 'gruppen'. One of these groups, 'Rastellata', containing *P. rastellata* (Latreille), *P. laevisissima* Fr. Smith and *P. levior* Roger largely corresponded with the modern day concept of the subgenus *Cyrtomyrma* except that Mayr also included *P. imicronata* Fr. Smith that is now placed in the *micronata* species-group of the subgenus *Myrmhiopla* Forel. Emery (1896) accepted Mayr's system of 'gruppen', but reduced their number to four and named them 'coorti', with 'Coorte 2. *Polyrhachides carinatae*' divided into five 'manipuli', one of which, 'manipulus *rastellata*', corresponded with Mayr's 'Rastellata' group. Wheeler (1911) largely recognised Emery's four 'coorti' but formally named them as subgenera and added a fifth. Emery's '*Polyrhachides carinatae*' become the subgenus *Myrma* (sensu Wheeler, 1911). Forel (1915) further elaborated the classification of *Polyrhachis* by subdividing several of the subgenera established by Wheeler (1911). Forel (1915) removed several species from *Myrma* (corresponding to Emery's 'manipulus *rastellata*' and 'manipulus *revoili*') and placed them within a new subgenus *Cyrtomyrma*. Forel named *P. rastellata* as the type species of *Cyrtomyrma*, but did not provide a description of the subgenus. In 1921, Emery removed *P. revoili* from *Cyrtomyrma* and placed it, with several other African species, into his newly established subgenus *Pseudocyrtomyrma* Emery (later synonymised with *Myrma*). Emery (1925) gave the first diagnosis of *Cyrtomyrma* and included 10 species and 15 subspecific forms within the subgenus. The first attempted revision of *Cyrtomyrma* was published by Donisthorpe (1938) who treated 23 species and 9 subspecies. He divided the subgenus into two main groups based on the shape of the pronotal humeri. Each of these groups was subdivided into two subgroups according to the presence or lack of propodeal spines. More recently Dorow (1995) gave an overview of the higher classification of *Polyrhachis* and included keys to the subgenera. He also included diagnoses and lists of species for all the subgenera, together with notes on the their history, phylogeny and distribution. Bolton (1995) published the latest list of *Cyrtomyrma* species, including all available and unavailable

names, in his catalogue of world ants. The world fauna of *Cyrtomyrma* was revised by Than (1978) in his PhD thesis, but this work was not subsequently published. However, numerous 'type' specimens bearing his manuscript names have been distributed to several museums. These specimens have no nomenclatural status and should be ignored.

DIAGNOSIS

Worker. Relatively small ants (HL < 2.10) with general characteristics of the genus. Head relatively large, more-or-less triangular in frontal view, with sides moderately convex and anteriorly converging in front of eyes; behind eyes, sides of head rounded into broadly convex occipital margin; strong, longitudinal carina running from occipital corners towards mandibular bases and separating gena from ventral parts of head (carina absent in *P. achterbergi* sp. nov. and *P. widodoi* sp. nov.). Mandibular masticatory border with 5 teeth, apical tooth longest, subsequent teeth gradually reducing in length. Anterior clypeal margin in most species with central, truncate flange, usually notched medially and flanked by distinct angles or acute denticles (anterior clypeal margin deeply emarginate medially in *P. widodoi*; with a central, projecting blunt tooth in *P. achterbergi*); basal clypeal margin usually only moderately impressed, laterally indicated by a thin line. Eyes relatively large, ranging from flat to distinctly convex; ocelli mostly absent. Frontal carinae strongly sinuate in most species. Mesosoma moderately to strongly longitudinally and transversely convex, with dorsum totally immarginate. Pronotal humeri toothed, angular or simply rounded; promesonotal suture distinct, metanotal groove absent or weakly indicated by a faint line or slight depression in lateral outline. Propodeum armed with short spines, tubercles, or completely unarmed, descending into declivity in a more-or-less smooth, medially uninterrupted line. Petiole scale-like, usually armed with four spines or teeth of variable length and configuration, rarely with backwards directed, long and slender lateral spines (as in *P. sedlaceki* sp. nov.) or with all spines reduced to minute denticles (as in *P. semiinermis* Donisthorpe, *P. damum* sp. nov. and *P. brevinoda* sp. nov.). Gaster large, globose, first segment occupying about half its length. All body surfaces rather smooth (highly polished in *P. sedlaceki*), with sculpturation consisting mostly of very fine, superficial reticulations with scattered minute pits; sculpture becoming distinctly more coarsely reticulate laterally; a few species (*P.*

achterbergi, *P. bruehli* sp. nov., *P. inflata* sp. nov., *P. luctuosa* Emery, *P. vitalisi* Santschi and *P. widodoi*) with head, mesosoma and petiole more heavily sculptured, reticulate-punctate, opaque. Colour of body mostly black, more rarely blue.

Queen. Similar to worker, with usual characters identifying full sexuality, including three ocelli and fully developed thoracic structure with wings. Armament of pronotal humeri markedly reduced; propodeal and petiolar spines distinctly shorter, but queens of some species (e.g. *P. robsoni* sp. nov.) with short propodeal spines that are completely absent in workers; sculpturation and colour virtually identical to worker.

Male. Males of many species are known, but their diagnosis is beyond the purpose and scope of this paper.

Distribution and biology. The known distribution of the subgenus ranges from China to India and Sri Lanka and south across Indonesia and New Guinea to the Solomon Islands and northern Australia. All known species are arboreal, building nests of silk and vegetation debris between the leaves and shrubs of trees. However, some species are occasionally lignicolous, using available cavities such as bamboo internodes or hollow branches, the walls of which they line with silk (Robson & Kohout, 2005). Some species (e.g. *P. inducta* sp. nov., *P. mondoi* Donisthorpe) have also been found nesting under bark on living trees.

INFRASPECIFIC TAXA ELEVATED TO SPECIFIC STATUS

As a result of examination of numerous types and other available material of species related to *P. laevissima* Fr. Smith and *P. rastellata*, I propose seven subspecies be elevated to specific status. Three that occur in areas outside the main geographic scope of this paper are treated below. The others are treated within their geographic provenance; one from New Guinea and three from the Solomon Islands.

Polyrhachis celebensis Viehmeier, 1913 stat. nov.

Polyrhachis rastellata var. *celebensis* Viehmeier, 1913: 155. Syntype workers. Type locality: INDONESIA, SULAWESI (in copal), MNHU (examined).

Polyrhachis (*Cyrtomyrma*) *rastellata* var. *celebensis* Viehmeier, Emery, 1925: 208; Donisthorpe, 1938: 256.

REMARKS. Following examination of both available syntypes, I consider *P. celebensis* to be

a distinct species from *P. rastellata*. *Polyrhachis celebensis* is characterised by angular pronotal shoulders armed with diminutive denticles, a petiole armed with four spines (the dorsal pair rather prominent and slightly longer than the lateral pair) and black legs. In contrast, the pronotal shoulders in *P. rastellata* are narrowly rounded, the petiolar spines subequal in length and the legs distinctly orange or light reddish-brown.

Polyrhachis corporaali

Santschi, 1928 stat. nov.

Polyrhachis (*Cyrtomyrma*) *rastellata* var. *corporaali* Santschi, 1928: 134, fig. 2. Syntype workers, queen. Type locality: INDONESIA, Sumatra, Medan (J.B. Corporaal), NHMB (examined).

REMARKS. *Polyrhachis corporaali* was described by Santschi as the 'smallest known variety of *rastellata*'. It is easily separated from that species by its much smaller size, distinctly toothed pronotal shoulders and closely approximated frontal carinae resulting in an extremely narrow central area.

Polyrhachis semiinermis

Donisthorpe, 1941 stat. nov.

Polyrhachis (*Cyrtomyrma*) *rastellata* var. *semi-inermis* Donisthorpe, 1941: 209. Syntype workers. Type locality: PHILIPPINES, Luzon, Baguio (A. Moore), BMNH (examined).

REMARKS. *Polyrhachis semiinermis* is characterised by widely rounded pronotal shoulders and a petiole that is virtually parallel-sided with the petiolar teeth reduced to mere denticles or completely lacking. Based on these characters, *P. semiinermis* is much more closely related to the newly described *P. danum* from Borneo and *P. brevinoda* from Australia than to *P. rastellata*.

CHECKLIST OF AUSTRALIAN SPECIES

Synonyms are indented with non-Australian junior synonyms excluded.

P. abbreviata sp. nov.

P. australis Mayr, 1870

P. doddi Donisthorpe, 1938

P. nox Donisthorpe, 1938

P. townsvillei Donisthorpe, 1938

P. brevinoda sp. nov.

P. decumbens sp. nov.

P. delecta sp. nov.

P. expressa sp. nov.

P. hoelldobleri sp. nov.

P. mackayi Donisthorpe, 1938

P. monteithi sp. nov.

P. pilosa Donisthorpe, 1938

P. robsoni sp. nov.

P. rutila sp. nov.

P. yorkana Forel, 1915

Taylor & Brown (1985) and Kohout & Taylor (1990) included *P. rastellata* in their list of Australian species. However, following examination of *P. rastellata* specimens from India and Sri Lanka and their comparison with extensive material of Australian *Cyrtomyrma*, I am reasonably confident that *P. rastellata* does not occur in Australia.

Kohout (2000) also suggested *P. debilis* Emery occurred in Queensland's Wet Tropics and more recently, similar specimens have been collected on Melville I. off the coast of the Northern Territory (A. Andersen, pers. comm.). However, direct comparison of these specimens with several syntypes of *debilis* (MCSN, MCZC, NMNH) has shown that they are not conspecific. Specimens from the Wet Tropics listed as *P. debilis* by Kohout (2000) are *P. yorkana* Forel (see below). Those from Melville I. probably represent a new species but there is insufficient material to describe it here. The type locality of *P. debilis* (Fly River, Papua New Guinea) is situated just across Torres Strait from Cape York Peninsula and a number of *Polyrhachis* species (e.g. *P. sexspinosa* (Latreille), *P. schlenckii* Forel, *P. andromache* Roger, *P. brevinoda* sp. nov. and *P. decumbens* sp. nov.) occur in both areas. Despite the vast amount of *Cyrtomyrma* material available from Cape York Peninsula, I have not found any specimens satisfactorily comparable with the *P. debilis* syntypes. Consequently, until proven otherwise, I regard *P. debilis* as a New Guinean element not occurring in Australia.

KEY TO *CYRTOMYRMA* SPECIES FROM AUSTRALIA (based on worker caste)

1. Pronotal shoulders in dorsal view more-or-less toothed or obtusely angular; greatest width of pronotal dorsum across, or just below shoulders (e.g. Figs 2I, 3G, 4B) 2

Pronotal shoulders in dorsal view narrowly or widely rounded; greatest width of pronotal dorsum at, or about, middle of its length (e.g. Figs 2E, 2G, 4D) 7

2. Propodeum armed with a pair of spines, denticles or tuberculae (e.g. Figs 2H, 3D, 4A, 4G) 3

Propodeum totally unarmed (Fig. 3F). *.robsoni* sp. nov.

3. Dorsal surfaces of body covered with numerous relatively long, mostly erect or variously curved hairs (Fig. 3D) *monteithi* sp. nov.

Dorsal surfaces of body with only a tuft of erect hairs on summit of mesosoma and a few hairs on dorsum of head and along apical segments of gaster (e.g. Figs 2H, 4A) 4

4. Propodeal spines well developed, generally longer than half distance between their bases (e.g. Figs 2F-G, 4A-B) ... 5

Propodeal spines much shorter than half distance between their bases or reduced to mere denticles or tuberculae (e.g. Figs 1D-E, 4G-H) 6

5. Pronotal shoulders distinctly toothed or bilobed (Fig. 2I); generally smaller (HL 1.40-1.47) .. *hoelldobleri* sp. nov.

Pronotal shoulders bluntly angular or narrowly rounded (Fig. 4B); generally larger (HL 1.53-1.72) *australis* Mayr (in part)

6. Smaller (HL 1.25-1.34); propodeal spines short, but always present (Fig. 1D-E); legs distinctly yellow, or light reddish-brown *abbreviata* sp. nov. (in part)

Larger (HL 1.56-1.62); propodeal spines very short or reduced to mere denticles or tuberculae (Fig. 4G-H); legs dark reddish-brown *yorkana* Forel (in part)

7. Dorsal surfaces of body covered with numerous erect and/or decumbent hairs (e.g. Figs 1H, 4E) 8

Dorsal surfaces of body virtually without hairs, except for tuft of erect hairs on summit of mesosoma, a few hairs on dorsum of head and along apical segments of gaster (Figs 2D, 4A) 10

8. Pubescence of body consisting of abundant, short to very short, somewhat decumbent or recumbent hairs; only a few scattered longer, erect hairs present (Figs 1H-I, 3H-I) 9

Pubescence of body consisting of numerous, relatively long, erect or variously curved hairs, covering most dorsal surfaces; only sparse decumbent hairs present (Fig. 4E-F) *pilosa* Donisthorpe

9. Body distinctly bicoloured, reddish-brown with gaster and appendages bright orange; mesosomal dorsum in lateral view distinctly impressed at promesonotal suture (Fig. 3H) *rutila* sp. nov.

Body unicoloured, jet-black with appendages mostly medium to dark reddish-brown; mesosomal dorsum in lateral view evenly rounded, without distinct impression at promesonotal suture (Fig. 1H) ... *decumbens* sp. nov.

10. Propodeum armed with a pair of spines, denticles or tuberculae (e.g. Fig. 4A, G) 11

Propodeum totally unarmed (e.g. Figs 1F, 2D, 4C) . 14

11. Mesosomal dorsum in lateral view distinctly flat or shallowly impressed at promesonotal suture (Fig. 2F) *expressa* sp. nov.

Mesosomal dorsum in lateral view evenly convex, without distinct impression at promesonotal suture (Figs 4A, 4G) 12

12. Lateral petiolar spines distinctly longer than dorsal pair; propodeal spines generally longer than half distance between their bases (Fig. 4A-B) .. *australis* Mayr (in part)

Lateral petiolar spines only slightly longer than dorsal pair, or all spines subequal; propodeal spines shorter than half distance between their bases (e.g. Figs 1D-E, 4G-H) 13

13. Propodeal spines short, but always present (Fig. 1D-E); legs distinctly yellow, or light reddish-brown *abbreviata* sp. nov. (in part)

Propodeal spines very short, present as strongly upturned denticles or more-or-less distinct tuberculae (Fig. 4G); legs dark reddish-brown *yorkana* Forel (in part)

14. Petiole virtually parallel-sided; petiolar spines very short, lateral spines reduced to denticles (Fig. 1G) *brevinoda* sp. nov.

Petiole with sides diverging dorsally; lateral petiolar spines at least as long as dorsal pair (Figs 2E, 4D) 15

15. Antennal scapes longer (SI >140); lateral petiolar spines distinctly longer than dorsal pair (Indonesia) (*euryala* Fr. Smith)

Antennal scapes shorter (SI <135); lateral and dorsal petiolar spines subequal in length 16

16. Pronotum in dorsal view strongly transverse, with humeri narrowly rounded or weakly angulate (Fig. 4D); petiole with sides only weakly diverging dorsally, spines shorter (Fig. 4C) (mid- to southern Queensland) *mackayi* Donisthorpe

Pronotum in dorsal view weakly transverse, with humeri widely rounded (Fig. 2E); petiole with sides more strongly diverging dorsally, spines longer (Fig. 2D) (far north Queensland) *delecta* sp. nov.

Polyrhachis abbreviata sp. nov.

(Fig. 1A, D-E)

MATERIAL. HOLOTYPE: QUEENSLAND, Mission Beach, c. 4km WbyS of, 17°53'S, 146°04'E, 29.ii.1996, lowland rf., ex silk nest between leaves, S.K.A. Robson #253 (worker). PARATYPES: data (and nest) as for holotype (157 workers, 1 dealate ♀). Type deposition: Holotype (QMT99331), most paratype workers and paratype ♀ in QM; 2 paratype workers each in AMNH, ANIC, BMNH, CASC, JCUT, MCZC, MHNG, MLAC and NMNH. OTHER MATERIAL: QUEENSLAND, Julatten, 16°37'S, 145°20'E, 2.v.1990 (BBL) (w); Black Mt Rd, 4km N of Kuranda, 16°47'S, 145°37'E, 21.vii.1980, rf. (RJK acc. 80.103, 107, 109) (w); Kuranda, c. 100ft, 4.vi.1962, rf. (RWT acc. 1322) (w); Coperlode Dam Rd, 16°58'S, 145°42'E, 17.x.1991-23.vii.1992, pitfall traps NQ42 (Lawless, Raven, Shaw) (w); Westgid Ck. Bellenden Ker Ra., 1.xi.1981 (GBM & Earthwatch Exp.) (w); Palmerston NP, 17°37'S, 145°48'E, 350-400m, 2.i.1990, rf. (GBM et al.) (w); Upper Boulder Ck, c. 8km N of Tully, 100-500m, 4.xii.1989 (GBM, Thompson, Janetski) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 4.84, 4.68-5.49; HL 1.31, 1.25-1.34; HW 1.22, 1.15-1.28; CI 93, 90-98; SL 1.56, 1.53-1.65; SI 128, 124-133; PW 0.94, 0.94-1.00; MTL 1.78, 1.72-1.87 (20 measured).

Clypeus in profile weakly convex; basal margin moderately impressed. Frontal triangle indistinct. Frontal carinae sinuate, margins weakly raised; central area with short furrow. Sides of head in front of eyes very weakly convex, almost straight, strongly converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view breaking lateral cephalic outline. Ocelli lacking, relative positions indicated in some specimens by minute depressions in cephalic sculpturation. Pronotum in dorsal view with humeri narrowly rounded, or bluntly angular in some specimens, with greatest width of segment just behind shoulders. Mesosoma in profile more-or-less evenly convex. Promesonotal suture distinct, metanotal groove feebly indicated laterally, indistinct dorsally. Propodeal spines very short, upturned. Petiole in lateral view with anterior face almost straight, posterior face convex; dorsum armed with four spines; dorsal pair triangular, tooth-like, closer to each other than to lateral teeth; lateral pair more acute and slightly longer; subpetiolar process in lateral view acute anteriorly, narrowly rounded posteriorly. Anterior face of first gastral segment relatively low, widely rounding onto dorsum of segment.

Mandibles finely, longitudinally striate-rugose. Dorsum of head, mesosoma, petiole and gaster very finely shagreened, rather polished, with scattered minute punctures and piliferous pits. Sculptural intensity increasing laterally and becoming rather strongly reticulate-rugose, notably on meso- and metapleurae and lower parts of petiole.

Several curved hairs along mandibular masticatory borders with hairs reducing in length towards bases. Anterior elypeal margin with only 1 or 2, relatively long, anteriorly directed setae medially and a few shorter setae fringing margin laterally. A few pairs of medium length, mostly erect hairs near anterior and basal clypeal margins and along frontal carinae; single pair of hairs on vertex and summit of mesosoma. Gaster with a few erect hairs along posterior margins of segments, notably towards apex and on venter. Head, mesosoma, petiole and gaster with very short, appressed pubescence arising from numerous pits and shallow punctures.

Colour. Body black. Mandibular masticatory borders reddish-brown. Antennae very dark brown, condylae and distal ends of scapes a shade lighter. Legs distinctly yellow, orange or reddish-brown, with coxae and proximal ends of tibiae a shade darker; tarsi very dark brown.

Queen. Dimensions: TL c. 7.21; HL 1.72; HW 1.56; CI 91; SL 1.93; SI 124; PW 1.62; MTL 2.40 (1 measured). Apart from sexual characters and distinctly larger size, closely resembling worker except: pronotal humeri rounded; mesoseutum only marginally wider than long with lateral margins rather strongly converging anteriorly, forming distinctly narrowly rounded anterior margin. Median line relatively short; parapsides rather flat, slightly raised posteriorly; mesoseutum in profile weakly convex anteriorly, virtually flat posteriorly. Mesoscutellum convex in lateral view, well elevated above dorsal plane of mesosoma; metanotal groove distinct. Propodeum armed with distinct, somewhat dorsoventrally compressed, weakly upturned spines; dorsum descending rather abruptly into virtually vertical declivity; petiolar spines marginally longer. Sculpturation, pilosity and colour as in worker.

Males unknown. Immature stages (eggs, larvae and pupae) deposited in the QM spirit collection.

REMARKS. *Polyrhachis abbreviata* is a relatively rare species apparently restricted to Queensland's Wet Tropics. Like other *Cyrtomyrma* species, it builds nests of larval silk and vegetation debris between the leaves of rainforest trees and shrubs. *Polyrhachis abbreviata* is rather similar to *P. yorkana* (Fig. 4G-H) with which it is sympatric at Mission Beach. They differ notably in their size (HL 1.25-1.34 in *P. abbreviata* versus 1.53-1.62 in *P. yorkana*) and in the colour of their appendages which, in *P. abbreviata*, are yellow, orange or light reddish-brown. In contrast the legs in *P. yorkana* are brown to dark reddish-brown. Also, the petiole in profile is distinctly lower and wider in *P. abbreviata* compared to *P. yorkana*. This species was listed as *Polyrhachis* 'Cyrt08' by Kohout (2000: 197).

Polyrhachis australis Mayr, 1870 (Fig. 4A-B)

Polyrhachis australis Mayr, 1870: 945. Holotype worker. Type locality: Port Maekay, Ostaustralien (= Maekay, QUEENSLAND) (type presumed lost). Neotype worker (here designated): Cape Hillsborough NP, 20°55'S, 149°02'E, 1.vi.1996 (RJK acc. 96.2) in QM (QMT99332).

Polyrhachis levior Roger, 1863: 8; Mayr, 1876: 71 (spurious synonymy of *P. australis* under *P. levior*).

Polyrhachis (*Cyrtomyrma*) *nox* Donisthorpe, 1938: 249, fig. 2. Synonymy by Kohout & Taylor, 1990: 513.

Polyrhachis (*Cyrtomyrma*) *townsvillei* Donisthorpe, 1938: 251, fig. 4. Synonymy with *P. doddi* Donisthorpe by Kohout, 1998: 527.

Polyrhachis (*Cyrtomyrma*) *doddi* Donisthorpe, 1938: 263, fig. 13. Synonymy by Kohout, 2000: 195.

Polyrhachis (*Cyrtomyrma*) *australis* Mayr. Kohout, 2000: 195, figs 2C, 4C.

REMARKS. Kohout & Taylor (1990) reported the absence of the holotype of *P. australis* from the Mayr collection (NHMW) and subsequent enquiries to the Hamburg Museum (ZIZM) support their opinion that it has been destroyed. However, when Mayr (1876) incorrectly synonymised *P. australis* with *P. levior*, he also listed 'Rockhampton' and 'Peak Downs' as localities additional to 'Port Mackay', from which specimens were sent to him by the Godeffroy Museum. Considering that Mayr regarded all these specimens as conspecific, the identity of *P. australis* can be established with confidence. I have examined eight available specimens of that series lodged in the Mayr collection and identified by Mayr between 1874-1876 as *P. levior* Roger. All bear identification tags in Mayr's handwriting reading '*P. laevior* (sic) R. det. G. Mayr' and locality labels variously inscribed 'Godeffr., Australia, 1876', 'Rockhampt., Godeffr., 1874' or 'Godeffr., Rockhampt., 1876'. Following its erroneous synonymy with *P. levior* (Mayr, 1876), *P. australis* became one of the most misunderstood Australian species of the subgenus and specimens from Queensland with more-or-less angular humeri and propodeal spines were commonly identified as *P. levior*. Donisthorpe (1932) was the first author who examined the unique holotype worker of *P. levior* in the W.W. Saunders collection in Oxford (OXUM) and realised that specimens from Queensland, supplied by F.P. Dodd and R.E. Turner, were not conspecific. Consequently, Donisthorpe (1938) described three new species from that material; *P. doddi*, *P. nox* and *P. townsvillei* which are all now considered synonyms of *P. australis*.

In order to establish the nomenclatural stability of the species, I hereby designate, in accordance with Article 75 of the International Code of Zoological Nomenclature (Fourth Edition), a worker specimen as the neotype of *Polyrhachis australis* Mayr. The specimen was directly compared and considered conspecific with the specimens from Queensland identified by Mayr as *P. levior* (see above) and with the syntypes of *P. doddi* and *P. nox*. The specimen was selected from a polydomous colony collected from a silk nest built between the leaves of low shrub in open forest at Cape Hillsborough NP (RJK acc. 96.2). This locality is situated only about 30km NW of Mackay, the type locality of *P. australis*. The neotype has been deposited in the QM, together with the rest of the colony consisting of 106 workers, 4 alate queens and numerous

immature stages (eggs, larvae in various stages of development and pupae).

Polyrhachis australis is a characteristic species combining more-or-less angular pronotal humeri with well developed propodeal spines. It closely resembles *P. hoelldobleri* described below, but differs in the development of pronotal humeri. In *P. australis* the humeri are obtusely angular or narrowly rounded (Fig. 4B), while all examined specimens of *hoelldobleri* have distinctly angular or virtually bilobed humeri (Fig. 21), similar to those of *P. levior* Roger from Indonesia or *P. pacifica* sp. nov. from the Solomons. In addition, the lateral petiolar spines in *P. australis* are distinctly longer than the dorsal spines, while all the petiolar spines in *P. hoelldobleri* are subequal. *Polyrhachis australis* is a rather common species in suitable localities along the tropical and subtropical coast of eastern Australia, ranging from about Cairns south to the Queensland-New South Wales border and as far west as Forty Mile Scrub and Undara. A single specimen has very recently been collected from Davenport Range NP in the Northern Territory (A. Andersen, pers. comm.). It is an arboreal species that builds nests of silk and vegetation debris between the leaves of trees and shrubs along the margins of lowland rainforests and woodlands.

***Polyrhachis brevinoda* sp. nov.**
(Fig. 1B, F-G)

MATERIAL. HOLOTYPE: QUEENSLAND, Kirrama Ra, c. 9km W of Kennedy, 18°12'S, 145°42'E, c. 110m, 4.vi.1996, rainforest, ex nest between leaves, R.J. Kohout acc. 96.14 (worker). PARATYPES: data (and nest) as for holotype (59 workers); Mission Beach, c. 4km WbyS of, 17°53'S, 146°04'E, 29.ii.1996, lowland rf., ex nest between leaves, S.K.A. Robson #256 (13 workers, 1 dealate ♀). Type deposition: Holotype (QMT99333), most paratypes from holotype nest, 7 paratypes and 1 paratype ♀ in QM; 4 paratypes (2 from holotype nest) each in ANIC, BMNH and MCZC; 2 paratypes (from holotype nest) each in AMNH, CASC, JCUT, MHNG, MLAC and NMNH. OTHER MATERIAL: PAPUA NEW GUINEA, Central Prov., nr Eilogo, 21.xii.1980 (J.W. Ismay) (w). WESTERN AUSTRALIA: West Kimberley, Windjana Gorge NP, 8.vii.2001 (P. Filewood #07) (single w). QUEENSLAND, Cape York Pcn., 12km W of Captain Billy, 11°38'S, 142°44'E, 7.xii.1992, rf. (P. Zborowski & K. Halpapp) (w); Iron Ra., 12°42'S, 143°18'E, 9-15.vi.1971, rf. (RWT & J. Feehan acc. 71.163) (w); ditto, 1-3.vii.1976, rf. (P. Filewood) (w); ditto, Gordon Ck x-ing, 14-16.i.1992, rf. (RJK acc. 92.2, 4) (w, ♀); ditto, 1-6.x.2000, rf. (RJK acc. 2000.128) (w); 9km ENE of Mt Tozer, 12°43'S, 143°17'E, 5-10.vii.1986 (T. Weir & A. Calder) (w);

11km ENE of Mt Tozer, 12°43'S, 143°18'E, 11-16.vii.1986 (T. Weir & A. Calder) (♀); West Claudie R., 12°44'S, 143°14'E, c. 50m, 3-10.xii.1985, rf. (GBM & DJC) (w); Home Rule, 15°45'S, 145°17'E, c. 200m, 9-11.vi.1996, rf. edge (CJB & RJK acc. 96.43) (w); Parrot Ck upper, 15°48'S, 145°16'E, 300m, 22.xi.1998, rf. (GBM, P. Bouchedard & A. O'Toole #1933) (w); Pilgrim Sands, c. 1km NW of Cape Tribulation, 16°04'S, 145°28'E, 1.i.1991 (R. Kitching) (w); Cape Tribulation, Canopy Crane Site, 16°06'S, 145°27'E, 9.v.1997 (SKR #550) (w); ditto, 9-10.ix.2001, lowland rf. (RJK acc. 2001.29, 32) (w, ♀); Noah Ck, S of Cape Tribulation, 16°08'S, 145°25'E, 13-19.x.1980 (GBM) (w); ditto, 25-28.vii.1993, rf., pyreth. (H. Mitchell) (w, ♀); Oliver Ck, 8km SWbyS of Cape Tribulation, 16°08'S, 145°26'E, 14.vi.1996, rf. (RJK acc. 96.53) (w); McLean Ck, c. 19km SbyW of Cape Tribulation, 16°15'S, 145°26'E, 15.vi.1996, rf. (RJK acc. 96.54) (w); Black Mtn Rd, Kuranda, 3.vi.1962, rf. (RWT acc. 1313) (w); Smithfield, 12km NW of Cairns, e. 1200ft, 16°50'S, 145°41'E, 5.v.1997, second rf. (SKR #553) (w); Bellenden Ker, Cableway Base stn, 17-24.x.1981 (GBM & Earthwatch Exp.) (w); ditto, 8-23.iv.1987 (E.C. Dahms & G. Sarnes) (w); Garradunga, Scymour Ra., c. 7km N of Innisfail, 17°28'S, 146°01'E, <100m, 5-6.vi.1996, lowland rf. (RJK & CJB acc. 96.31) (w); Mission Beach, 17°52'S, 146°05'E, 29.ii.1996 (SKR #256) (w, ♀, ♂); ditto, 13.x.2004, lowland rf. (SKR #1018, 1019) (w); Kirama Ra., e. 9km W of Kennedy, 18°12'S, 145°52'E, c. 110m, 4.vi.1996, rf. (RJK et al. accs 96.13, 14) (w); ditto, 31.x.1999, rf. (SKR #807) (w); Hinchinbrook I., Gayundah Ck, 18°21'S, 146°13'E, <100m, 8-18.xi.1984 (GBM) (w); Paluma, Little Crystal Ck, 19°00'S, 146°15'E, 29.ii.1996, primary rf. (SKR #147) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.49, 4.89-6.05; HL 1.40, 1.31-1.53; HW 1.31, 1.18-1.43; CI 93, 87-94; SL 1.81, 1.65-1.93; SI 138, 131-148; PW 1.09, 0.97-1.15; MTL 2.15, 1.93-2.31 (31 measured).

Clypeus in profile rather flat; basal margin weakly impressed. Frontal triangle indistinct. Frontal carinae sinuate with only moderately raised margins; frontal furrow weakly indicated. Sides of head in front of eyes very weakly convex; behind eyes rounding into convex occipital margin. Eyes convex, in full face view breaking lateral cephalic outline. Ocelli lacking; relative positions indicated in some specimens by minute depressions in cephalic sculpturation. Pronotum in dorsal view with humeri widely rounded; greatest pronotal width at or near mid-length of segment. Mesosoma in profile with pronotum rather steeply rising towards weakly convex summit; promesonotal suture distinct; metanotal groove lacking, slight depression in mesosomal outline indicating its position; propodeal dorsum sloping into oblique declivity in open curve. Petiole in

profile with anterior face almost straight, posterior face convex; in dorsal view petiole rather narrow, sides more-or-less parallel; petiolar spines very short, dorsal pair reduced to denticles and lateral pair usually merely angulate; subpetiolar process in lateral view acute anteriorly, angular with weakly concave margin posteriorly. Anterior face of first gastral segment lower than height of petiole, widely rounding onto dorsum of segment.

Mandibles very finely, longitudinally striate. Head, mesosoma and gaster very finely shagreened with sculptural intensity increasing laterally and becoming more reticulate over meso- and metapleurac and lateral portions of petiole. Scattered minute punctures in various densities present over all dorsal surfaces.

Several curved hairs along mandibular masticatory borders, numerous very short, appressed hairs arising from pits towards mandibular bases. Anterior clypeal margin usually with 2 long, anteriorly directed setae medially and several short setae along margin laterally. Semierect to erect, mostly paired hairs near anterior and basal clypeal margins and along frontal carinae, a pair of somewhat longer hairs on vertex. Single pair of long, but shorter than greatest diameter of eye, undulated hairs on summit of mesosoma. Medium length, semierect hairs lining posterior margins of gastral segments, their density increasing on venter of gaster. Very short, appressed hairs, arising from minute punctures and pits, distributed over most dorsal body surfaces.

Colour. Head, mesosoma, coxae, petiole and gaster mostly black. Antennae very dark reddish-brown with apical ends a shade lighter. Mandibular masticatory borders and legs medium reddish-brown with tarsi and proximal ends of tibiae darker.

Queen. Dimensions: TL c. 6.75; HL 1.61; HW 1.40; CI 87; SL 2.00; SI 143; PW 1.53; MTL 2.50 (1 measured). Apart from sexual characters, closely resembling worker except: pronotal humeri narrowly rounded; mesoscutum marginally wider than long with lateral margins distinctly converging anteriorly, forming narrowly rounded anterior margin; median line relatively short, bifurcate and slightly raised; parapsides weakly raised posteriorly; mesoscutum in profile with widely rounded anterior face and rather flat dorsum. Mesoscutellum very weakly convex, only marginally elevated above dorsal plane of mesosoma; metanotal groove distinct. Propodeal dorsum armed with distinct denticles; declivity

short and steep. Sculpturation, pilosity and colour virtually identical to worker.

Males and immature stages (eggs, larvae and pupae) deposited in the QM spirit collection.

REMARKS. *Polyrhachis brevinoda* is not an uncommon species within its main distribution which is centered on the Wet Tropics region of north Queensland, extending to Cape York Peninsula and apparently to the southern parts of Papua New Guinea. A single specimen has also been collected in the West Kimberly District of north-western Australia. *Polyrhachis brevinoda* is a rainforest species that builds silk nests between leaves in the lower arboreal zone. It is similar to *P. semiinermis* (Fig. 11C-D), described by Donisthorpe (1941: 209) from the Philippines and *P. damnn* sp. nov. (Fig. 6E-F) from Sabah, Borneo. All three species have widely rounded pronotal shoulders and virtually parallel-sided petioles with greatly reduced or rudimentary spines. *Polyrhachis brevinoda* differs in having the propodeal declivity descending in an oblique curve while in *P. semiinermis* and *P. damnn* the declivity is virtually vertical. Although the petiolar spines in *P. brevinoda* are short, the dorsal spines are relatively well defined, while the dorsal spines are more-or-less obsolete in the other two species. *Polyrhachis brevinoda* is also distinctly smaller than *P. damnn* (HL 1.31-1.53 versus 1.65-1.87 respectively) and has dark brown to black legs (always distinctly red in *P. damnn*). *Polyrhachis brevinoda* was listed as *P. 'Cyrt' 06* by Kohout (2000: 197).

***Polyrhachis decumbens* sp. nov.**
(Fig. 1C, H-I)

MATERIAL. HOLOTYPE: QUEENSLAND, Cape York Pen., Lockcrbie Scrub, 10°46'S, 142°29'E, 19-23.iii.1987, ex nest between leaves, R.J. Kohout acc. 87.67 (worker). PARATYPES: data (and nest) as for holotype (15 workers, 1 dealate ♀); data as for holotype, except RJK acc. 87.66 (4 workers). Type deposition: Holotype (QMT99334), 3 paratype workers and paratype ♀ (from holotype nest) and 2 paratype workers in QM; 4 paratype workers (2 from holotype nest) in ANIC; 2 paratype workers (from holotype nest) each in BMNH, MCZC, MHNG and NMNH. **OTHER MATERIAL:** PAPUA NEW GUINEA, Central Prov., Laloki R., c. 20km N of Port Moresby, 09°15'S, 147°05'E, 9.ii.1979, on citrus (E. Brough #C-234, 235) (w); ditto, Bisianumu, c. 30km NE of Port Moresby, 09°24'S, 147°24'E, 500m, 7.vi.1965, secondary rf. (J.L. Gressitt) (w). QUEENSLAND, Cape York Pen., Lockcrbie Scrub, 10°46'S, 142°29'E, 19-23.iii.1987, rf. (RJK acc. 87.20, 66) (w, ♀); ditto, 23-26.ix.2003, rf. (RJK acc. 2003.14, 16) (w); 15km

NE by E of Heathlands, 11°41'S, 142°42'E, 15-26.i.1992 (I. Naumann & T. Weir) (w); 14km ENE of Heathlands, 11°41'S, 142°42'E, 26.ii.1993 (P. Zborowski) (w); Heathlands, 11°45'S, 142°35'E, 18-20.viii.1992 (P. Zborowski & J. Cardale) (w); Iron Ra., 12°42'S, 143°18'E, 9-15.vi.1971 (RWT & J. Feehan aces 135, 138, 141, 148) (w); ditto, 1-3.vii.1976 (P. Filewood) (w); ditto, 17.iii.1984 (J.H. Sedláček) (w); ditto, Gordon Ck x-ing, 1-6.x.2000 (RJK acc. 2000.130) (w); East Claudie R., Iron Ra., 12°42'S, 143°17'E, 6.xii.1985, pyrethrum (GBM & DJC) (w); 9km ENE of Mt Tozer, 12°43'S, 143°17'E, 5-10.vii.1986, pantraps (J.C. Cardale) (w); 11km ENE of Mt Tozer, 12°43'S, 143°18'E, 11-16.vii.1986 (T. Weir & A. Calder) (w); West Claudie R., 12°44'S, 143°14'E, c. 50m, 3-10.xii.1985, pyrethrum (GBM & DJC) (w).

DESCRIPTION. *Worker:* Dimensions (holotype cited first): TL c. 5.14, 4.79-5.49; HL 1.34, 1.22-1.40; HW 1.31, 1.17-1.40; CI 98, 93-100; SL 1.65, 1.50-1.78; SI 126, 121-130; PW 1.00, 0.87-1.03; MTL 1.65, 1.65-1.93 (23 measured).

Clypeus in profile straight; basal margin moderately impressed. Frontal triangle indistinct. Frontal carinae sinuate, margins very weakly raised anteriorly, rather flat posteriorly. Sides of head in front of eyes weakly convex; rounding behind eyes into convex occipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri widely rounded; greatest pronotal width at or near mid-length of segment. Mesosomal dorsum in profile evenly convex; promesonotal suture distinct, metanotal groove lacking. Petiole with anterior face almost straight, posterior face weakly convex; dorsum armed with four subequal, acute spines. Subpetiolar process acute anteriorly, rounded posteriorly. Anterior face of first gastral segment straight, relatively low, narrowly rounding onto dorsum of segment.

Head, mesosoma and gaster shagreened, with intensity of sculpturation markedly increasing laterally, becoming distinctly wrinkled; sculpturation strongly reticulate-rugose on meso- and metapleurae and sides of petiole.

Several curved and suberect hairs on mandibular masticatory borders with shorter appressed hairs towards mandibular bases. Anterior clypeal margin with 1 long and 2 slightly shorter, anteriorly directed setae medially and several short setae fringing margin laterally. Mostly paired, medium length, erect hairs near anterior and basal margins of clypeus, along frontal carinae and on vertex; tuft of usually 4 erect, undulated, medium length hairs on summit of mesosoma. Gaster with numerous semierect hairs lining posterior margins

of apical segments, more numerous on venter. Pubescence consisting of abundant very fine, short, decumbent and semierect hairs everywhere, including appendages, but excluding propodeal declivity that is smooth and shiny.

Colour: Black with mandibles, clypeus, sides of head and tibiae medium to dark reddish-brown, except mandibular masticatory borders and legs, including coxae, distinctly lighter. Dorsum of gaster black, posterior margins of segments diffusely lined with dark reddish-brown.

Queen. Dimensions (queen from nest of holotype cited first): TL c. 7.00, 7.26; HL 1.62, 1.72; HW 1.43, 1.59; CI 88, 92; SL 1.96, 2.06; SI 137, 129; PW 1.56, 1.68; MTL 2.46, 2.59 (2 measured). Apart from sexual characters, closely resembling worker except: pronotal humeri rounded; mesoscutum marginally wider than long with lateral margins converging anteriorly, forming relatively narrowly rounded anterior margin; median line bifurcate and weakly raised; parapsides flat anteriorly, slightly raised posteriorly; mesoscutum in profile with widely rounded anterior face and very weakly convex dorsum. Mesoscutellum only weakly convex, marginally elevated above dorsal plane of mesosoma. Metanotal groove distinct. Propodeum armed with distinct denticles; dorsum descending abruptly into virtually vertical declivity. Sculpturation, pilosity and colour virtually as in worker.

Male unknown. Immature stages (eggs, larvae and pupae) deposited in the QM spirit collection.

REMARKS. The distribution of *P. decumbens* appears to be centered on Cape York Peninsula, north of the 13° parallel, extending to southern Papua New Guinea. It is a rather common species at suitable rainforest localities where it builds arboreal nests of silk and vegetation debris between the leaves of trees and shrubs. *Polyrhachis decumbens* is similar to *P. nomo* (Fig. 10G-H) from New Guinea. Both share the characteristic pile of short, decumbent hairs covering most of the body. However, the pubescence in *P. decumbens* is abundant, while it is rather diluted in *P. nomo*. They differ in other aspects, including their relative size (HL 1.22–1.40 in *P. decumbens* versus 1.47–1.50 in *P. nomo*), and in the shape of their heads. In *P. nomo* the head is wider than long (CI 104–106) with the eyes not reaching the lateral cephalic outline in full face view. In *P. decumbens* the head is mostly longer than wide (CI 93–100) and the eyes clearly break the lateral

cephalic outline. Both species feature rounded lateral pronotal margins, but several *P. decumbens* specimens from Iron Range have weakly indicated, blunt humeral angles and the pronotal dorsum is distinctly widest across the shoulders. Some of these specimens also feature more-or-less distinct, rudimentary propodeal spines or tubercles, that are completely absent in specimens of other populations of *P. decumbens* and in *P. nomo*. The spines of the petiole in *P. decumbens* are subequal, while in *P. nomo* the lateral petiolar spines are distinctly longer.

***Polyrhachis delecta* sp. nov.**
(Fig. 2A, D-E)

MATERIAL. HOLOTYPE: QUEENSLAND, Palmerston NP, 17°37'S, 145°48'E, c. 400m, 4.v.1997, primary rf, S.K.A. Robson aec. #551 (worker). PARATYPES: data (and nest) as for holotype (294 workers, 1 dealate ♀, 67 alate ♀♀, 77 ♂♂). Type deposition: Holotype (QMT99335), paratype dealate ♀, most paratype workers, alate ♀♀ and ♂♂ in QM; 3 paratype workers and 1 paratype alate ♀ each in ANIC, BMNH and MCZC; 2 paratype workers each in AMNH, CASC, JCUT, MHNG, MLAC and NMNH. OTHER MATERIAL: QUEENSLAND, Helenvale, 15°42'S, 145°13'E, 10–20.vii.1976 (P. Filewood) (w); Home Rule, 15°45'S, 145°17'E, c. 200m, 9–11.vi.1996, rl. edge (RJK & CJB acc. 96.43) (w); ditto, x–xi.1974 (T.P. Tebble) (w); Mt Hartley, 15°46'S, 145°19'E, 500–700m, 11.v.1996, rf. (CJB) (w); Shiptons Flat, 15°47'S, 145°13'E, 240m, 5.xii.1990 (GBM et al.) (w); Pilgrim Sands, c. 1km NW of Cape Tribulation, 16°04'S, 145°28'E, 1.ii.1991, fogging (R. Kitching) (w); Cape Tribulation, Canopy Crane site, 16°06'S, 145°27'E, 9–10.ix.2001, lowland rf. (RJK accs 2001.17, 19) (w, ♀); ditto, ix.1999–iii.2002 (N. Blüthgen) (w); ditto, 9.ix.2001 (S. Yamane #33) (w); Mt Hemmant, 6km SW of Cape Tribulation, 16°07'S, 145°25'E, 25.iv.1983 (GBM & DJC) (w); Noah Ck, S of Cape Tribulation, 16°08'S, 145°25'E, 25–28.vii.1993, pyreth. (H. Mitchell) (w); Rumula, Kingfisher Pk, 16°35'S, 145°20'E, 13.x.2004, c. 400m (S. Townsend) (w, ♀); Kuranda, 16°49'S, 145°38'E, 10–20.vii.1976 (P. Filewood) (w); Cairns, Botanic Gardens, 16°54'S, 145°45'E, 19.x.1996 (SKR #647) (w); Crystal Cascades nr Cairns, 16°57'S, 145°40'E, 2.iii.1996, primary rf. (SKR #214) (w); Bell Peak Nth, 20km S of Cairns, 17°05'S, 145°53'E, 16.ix.1981 (GBM & DJC) (w); Goldsborough Valley SF, c. 10km SW of Gordonvale, 17°09'S, 145°42'E, 18.x.1995 (SKR #54) (w); ditto, 29.ii.1996, prim. rf. (SKR #219, 223) (w, ♀); Atherton Tbl, Yungaburra, Paterson Ck, 17°16'S, 145°34'E, c. 700m, 29.ix.2003 (RJK aec. 2003.29) (w); ditto, 19.vii.2004 (SKR #1007.1008) (w); Bellenden Ker, Cableway Base Stn, 17–24.x.1981 (GBM & Earthwatch Exp.) (w); ditto, 8–23.iv.1987 (E. Dahms & G. Sarnes) (w); The Boulders, 6km W of Babinda, 17°20'S, 145°52'E, 18.v.1990, rf. (BBL) (w); Babinda, 17°21'S, 145°56'E, 4.viii.1985,

rf. edge (BBL) (w); Stone Ck, Scymour Ra., 17°27'S, 146°01'E, 22.viii.1995 (P. Hasenpush) (w); Etty Bay, 7km ESE of Innisfail, 17°33'S, 146°05'E, 23.vii.1980 (RJK acc. 80.156) (w); NE of Tully, nr Bingli Bay, 30.iv.1969 (RWT acc. 69.135) (w); Mission Beach – El Arish Rd, 17°52'S, 146°04'E, 4.xii.1995, lowland rf. (SKR # 802) (w); Tam O'Shanter FP, c. 4km WbyS of Mission Bch, 17°53'S, 146°04'E, 29.ii.1996, lowland rf. with *Licuala* palms (SKR #260) (w, ♀); ditto, 19.x.1996 (SKR #645, 648) (w, ♂); ditto, 7.ix.2001 (RJK acc. 2001.13) (w); ditto, 8.ix.2001 (S. Yamane #17) (w); 6km W of Sth Mission Beach, 17°56'S, 146°02'E, 18-19.vii.1980, lowland rf. (RJK acc. 80.66) (w); Kirrama Ra., c. 9km W of Kennedy, 18°12'S, 145°52'E, primary rf., 7.ix.2001 (S. Yamane) (w, ♂); Palm I., 18°45'S, 146°36'E, 450m, 20-21.ii.2001, rf. (G.B. Monteith #8323, 8332) (w); Mt Elliot NP, North Ck, 500-800m, 2.xii.1986 (GBM et al.) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 6.35, 5.90-6.50; HL 1.62, 1.47-1.62; HW 1.59, 1.40-1.59; CI 98, 93-100; SL 1.90, 1.81-1.96; SI 119, 119-129; PW 1.25, 1.15-1.28; MTL 2.31, 2.09-2.37 (25 measured).

Clypeus in profile rounding into shallowly impressed basal margin in weakly convex line. Frontal triangle rather indistinct. Frontal carinae sinuate with moderately raised margins; central area with moderately impressed frontal furrow. Sides of head in front of eyes very weakly convex; behind eyes rounding into convex occipital margin. Eyes moderately convex, in full face view just breaking lateral cephalic outline. Ocelli lacking. Pronotal humeri in dorsal view widely rounded; greatest width of pronotum at mid-length of segment. Mesosoma in profile evenly convex; promesonotal suture distinct; metanotal groove lacking, position indicated by slight depression in mesosomal outline; propodeal dorsum narrowly rounding into rather steep declivity. Petiole with anterior face almost straight, posterior face convex; dorsal margin armed with four acute, subequal spines. Subpetiolar process angular anteriorly, blunt posteriorly. Anterior face of first gastral segment relatively low, widely rounding onto dorsum of segment.

Mandibles very finely, longitudinally rugose. Dorsum of head, mesosoma and gaster finely shagreened with intensity of sculpturation increasing laterally, sides of mesosoma and petiole strongly reticulate-rugose. All dorsal body surfaces, including mandibles, with numerous minute punctures and piliferous pits.

Several curved and semierect hairs arising from mandibular masticatory borders. Anterior clypeal margin usually with 3 longer, anteriorly

directed setae and fringe of shorter setae lining margin laterally. Several paired, medium length, hairs near anterior and basal clypeal margins and along frontal carinae; a pair of somewhat longer hairs on vertex. Tuft of a few, weakly curved hairs, shorter than greatest diameter of eye, on summit of mesonotum. Medium length hairs lining posterior margins of gastral segments, more numerous on venter.

Colour. Black, including antennae, coxae and tarsi. Mandibular masticatory borders, extreme tip of apical funicular segments, condylae and posterior margins of gastral segments reddish-brown. Femora and tibiae light to medium reddish-brown, except proximal ends of tibiae distinctly darker.

Queen. Dimensions: TL c. 7.26-8.06; HL 1.72-1.78; HW 1.65-1.68; CI 93-98; SL 2.03-2.09; SI 121-127; PW 1.81-1.93; MTL 2.56-2.71 (6 measured). Apart from sexual characters, similar to worker except: eyes larger, in full face view clearly breaking cephalic outline. Pronotal humeri narrowly rounded; mesoscutum marginally wider than long; lateral margins converging anteriorly, forming relatively widely rounded anterior margin; median line bifurcated posteriorly; parapsides weakly indicated, slightly raised posteriorly; mesoscutum in profile with relatively high, widely rounded anterior face and flat dorsum. Mesoscutellum in profile convex, weakly elevated above dorsal plane of mesosoma; metanotal groove distinct. Propodeal dorsum descending into virtually vertical declivity. Petiole with spines shorter and blunter. Sculpturation and colour pattern essentially as in worker.

Males and immature stages (eggs, larvae and pupae) deposited in the QM spirit collection.

REMARKS. *Polyrhachis delecta* is a rather common species, endemic to the rainforests of Queensland's Wet Tropics. Its nesting habits are like those of other *Cyrtomyrma* species that build their nests between the leaves of trees and shrubs. *Polyrhachis delecta* is remarkably similar to *P. euryala* Fr. Smith from Indonesia (discussed below under the New Guinean species). Both are distinctly slender with a relatively narrow mesosoma and widely rounded pronotal shoulders. However, *P. delecta* has distinctly shorter antennal scapes (SI 119-129 versus 140-147 in *P. euryala*) and subequal petiolar spines. In *P. euryala* the lateral petiolar spines are distinctly longer than the dorsal pair.

***Polyrhachis expressa* sp. nov.**
(Fig. 2B, F-G)

MATERIAL. HOLOTYPE: QUEENSLAND, Cape York Pen., Iron Ra. NP, nr Gordon Ck x-ing, 12°42'S, 143°18'E, 1-6.x.2000, R.J. Kohout acc. 2000.177 (worker). PARATYPES: data as for holotype (269 workers). Type deposition: Holotype (QMT99336) and most paratypes in QM; 4 paratypes each in ANIC, BMNH and MCZC; 2 paratypes each in AMNH, CASC, JCUT, MHNG, MLAC and NMNH. OTHER MATERIAL: QUEENSLAND, Cape York Pen., Iron Ra. NP, 12°42'S, 143°18'E, 9-15.vi.1971, rf. (RWT & J. Feehan acc. 71.148) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.64, 5.49-6.15; HL 1.47, 1.43-1.56; HW 1.47, 1.42-1.56; CI 100, 99-103; SL 1.78, 1.72-1.84; SI 121, 116-122; PW 1.12, 1.06-1.18; MTL 2.18, 2.12-2.31 (16 measured).

Clypeus in profile straight anteriorly, rounding posteriorly into moderately impressed basal margin. Head about as wide as long; sides of head in front of eyes weakly convex; behind eyes sides converging into convex occipital margin. Eyes only moderately convex, in full face view just breaking lateral cephalic outline. Ocelli lacking. Pronotal humeri widely rounded in dorsal view. Mesosoma in profile with pronotal dorsum strongly convex, rising steeply towards short summit and descending towards distinct promesonotal suture; mesonotum weakly convex, metanotal groove indistinct, indicated only by depression in lateral outline; propodeal dorsum rather flat, armed with a pair of relatively long, slender, bluntly terminated spines. Petiole with anterior face almost straight, posterior face moderately convex; dorsal margin armed with four spines, dorsal pair broad-based and tooth-like, lateral pair widely diverging, slender, more than twice as long as dorsal pair. Subpetiolar process acute anteriorly, narrowly rounded posteriorly. Anterior face of first gastral segment flat, narrowly rounding onto dorsum of segment.

Head and gaster finely shagreened with dense cover of minute punctures and piliferous pits. Mesosoma and petiole more strongly sculptured with intensity of sculpturation distinctly increasing laterally; lower portions of pronotum, meso- and metapleurae and petiole, strongly reticulate-rugose.

Several curved or semirect hairs on masticatory borders, with distinctly shorter, mostly appressed hairs towards mandibular bases. Anterior clypeal margin medially with several rather long, anteriorly directed setae and with fringe of shorter

setae lining margin laterally. A few medium length hairs along ventral margins of gastral segments. Very short, appressed hairs, arising from minute punctures and pits, rather densely distributed over all dorsal body surfaces.

Dorsum of head, antennal scapes, mesosoma, petiole, first gastral segment and tarsi black. Mandibles, condylae, antennal scapes distally, narrow bands on funicular segments, and legs, including coxae, medium to dark reddish-brown. Extreme tip of apical funicular segment distinctly lighter. Clypeus, sides of head and posterior margins of gastral segments somewhat diffusely reddish-brown.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis expressa* is known only from the type locality at Iron Range and all of the 270 specimens of the type series were collected foraging on stems of *Bamboosa forbesi* within a small area of monsoonal rainforest. Their nesting habit is unknown, but it is very probable that they use hollow bamboo internodes. *Polyrhachis expressa* is very similar to *P. emeryana* Mann (Fig. 12A-B) from the Solomons. Both species have widely rounded pronotal shoulders, a propodeum armed with spines and distinctly elongated lateral petiolar spines. However, *P. expressa* differs by its finer sculpturation, notably on the dorsum of the head and mesosoma, and its less convex pronotal dorsum. The propodeal spines in *P. expressa* are quite long, columnar and bluntly terminated, while in *P. emeryana* they are short, triangular and acute. Also, the appressed pubescence in *P. expressa* is extremely short and inconspicuous, while it is distinctly longer and more prominent in *P. emeryana*.

***Polyrhachis hoelldobleri* sp. nov.**
(Fig. 2C, H-I)

MATERIAL. HOLOTYPE: QUEENSLAND, Kirrama Ra., c. 9km W of Kennedy, 18°12'S, 145°52'E, 110m, 4.vi.1996, primary rf., R.J. Kohout et al. acc. 96.13 (worker). PARATYPES: data as for holotype (7 workers); Kuranda, 16°49'S, 145°39'E, 5.vii.1980, B. Hölldobler #109 (2 workers); The Boulders, c. 6km W of Babinda, 17°21'S, 145°52'E, 3.ii.1958, Darlington (1 worker); East Palmerston, 1.6km E, 17°35'S, 145°50'E, c. 200m, 6.xi.1966, rf., R.W. Taylor accs 66.283, 286 (2 workers, 1 ♀). Type deposition: Holotype (QMT99337) and 2 paratypes in QM; 2 paratype workers, 1 paratype ♀ in ANIC, 2 paratype workers in BMNH and MCZC; 1 paratype worker in IZUW (Hölldobler coll.).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.64, 5.24-6.60; HL 1.47, 1.47-1.68; HW 1.50, 1.43-1.65; CI 102, 96-102; SL 1.75, 1.68-2.00; SI 117, 117-121; PW 1.22, 1.18-1.40; MTL 2.03, 2.03-2.40 (9 measured).

Clypeus in profile straight anteriorly, weakly rounding posteriorly into moderately impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with moderately raised margins; central area weakly convex with short, weakly indicated frontal furrow. Sides of head in front of eyes weakly convex; behind eyes sides rounding into convex occipital margin. Eyes moderately convex, in full face view just reaching cephalic outline. Ocelli lacking; relative positions indicated by shallow punctures in sculpture. Pronotum in dorsal view strongly transverse with humeri distinctly toothed or bilobed. Mesosoma in profile more-or-less evenly convex; promesonotal suture distinct, metanotal groove lacking dorsally, weakly indicated laterally; propodeum armed with pair of relatively long, upturned spines; declivity rather short, steep. Petiole relatively low, anterior face almost straight, posterior face moderately convex; dorsum armed with four spines; lateral pair more slender and slightly longer than dorsal pair. Subpetiolar process angular anteriorly, narrowly rounded posteriorly. Anterior face of first gastral segment relatively low, evenly rounding onto dorsum of segment.

Mandibles very finely, longitudinally rugose with shallow, minute punctures. Head, mesosoma and gaster finely shagreened; intensity of sculpturation moderately increasing across lateral portions of mesosoma with meso- and metapleurac and petiole rather weakly reticulate-rugose.

Several curved and semierect hairs arising from mandibular masticatory borders. Anterior clypeal margin medially with 1 or 2 anteriorly directed longer setae and several shorter setae lining margin laterally. Medium length, erect hairs, mostly in pairs, near anterior and basal clypeal margins, along frontal carinae, on vertex and summit of mesosoma. Only a few hairs lining apical gastral segments with more hairs on gastral venter.

Colour. Mostly black, with extreme tips of apical funicular segments, condylae and mandibular masticatory border narrowly reddish-brown. Antennae, including funiculi, very dark brown to black. Legs, including trochanters, light to medium reddish-brown with distal half of femora and proximal half of tibiae a shade darker; tarsi black.

Queen. Dimensions: TL c. 7.51; HL 1.81; HW 1.78; CI 98; SL 2.03; SI 114; PW 1.72; MTL 2.68 (1 measured). Single dealate queen, apart from sexual characters, very similar to worker mounted on same pin except: eyes more prominent, clearly breaking lateral cephalic outline in full face view. Pronotal humeri produced into blunt, angular prominences; mesoscutum marginally wider than long with lateral margins distinctly converging anteriorly, forming rounded anterior margin; median line weakly indicated, bifurcate posteriorly; parapsides flat, weakly raised posteriorly; mesoscutum in profile with widely rounded anterior margin and flat dorsum. Mesoscutellum in lateral view marginally raised above dorsal plane of mesosoma, weakly convex; metanotal groove distinct. Propodeum armed with pair of distinct, blunt, somewhat dorsoventrally flattened spines; propodeal declivity very steep. Petiole relatively low with lateral spines only moderately elongated; dorsal pair reduced to short, broad-based teeth. Sculpturation, pilosity and colour as in worker.

Male and immature stages unknown.

REMARKS. *Polyrhachis hoelldobleri* has been collected on only a few occasions. Repeated visits to the type locality failed to produce any additional specimens (SKR *pers. comm.*). The type series specimens were swept from low foliage and vegetation (RJK) and hand collected from low foliage (B. Hölldobler) or from the logs and trunks of recently felled trees (RWT). *Polyrhachis hoelldobleri* is evidently restricted to the eastern slopes of the Great Dividing Range within Queensland's Wet Tropics. It is characterised by its strongly transverse pronotal dorsum with the shoulders distinctly angular or bilobed and is similar to *P. pacifica* sp. nov. (Fig. 12C-D) from the Solomons. However, they differ markedly in the outline of the mesosoma. In *P. hoelldobleri* the mesosomal dorsum is more-or-less evenly rounded, while *P. pacifica* features a very prominent, strongly convex pronotal dorsum, similar to that in *P. emeryana* and *P. expressa*. *Polyrhachis hoelldobleri* was listed as *P. 'Cyrt' 09* by Kohout (2000: 197).

***Polyrhachis mackayi* Donisthorpe, 1938**
(Fig. 4C-D)

Polyrhachis (Cyrtomyrma) mackayi Donisthorpe, 1938: 258, fig. 9; Kohout, 2000: 195. Syntype workers, queen. Type locality: QUEENSLAND, Mackay (R.E. Turner). BMNH (examined).

REMARKS. *Polyrhachis mackayi* is characterised by the evenly convex profile of the mesosomal dorsum (Fig. 4C), rounded pronotal humeri, a completely unarmed propodeum and relatively short and subequal petiolar spines. It ranges from just north of Mackay in Queensland south to Taree in northern New South Wales, where, together with *P. pilosa*, it represents the southern-most limit of the distribution of the subgenus. *Polyrhachis mackayi* is a relatively uncommon species that builds its nests between the leaves of trees and shrubs, mostly along the margins of lowland rainforests and woodlands.

***Polyrhachis monteithi* sp. nov.**
(Fig. 3A, D-E)

MATERIAL. HOLOTYPE: QUEENSLAND, Garradunga, Seymour Ra., c. 7km N of Innisfail, 17°28'S, 146°01'E, <100m, 5-6.vi.1996, lowland rf., R.J. Kohout acc. 96.30 (worker). PARATYPES: data (and nest) as for holotype (12 workers, 7 alate ♀♀, 15♂♂); data as for holotype, except RJK acc. 96.22 (75 workers, 2 dealate, 2 paratype alate ♀♀). Type deposition: Holotype (QMT99338), 6 paratype workers, 4 paratype ♀♀, paratype ♂♂ (from holotype nest) and most paratype workers and paratype ♀♀ in QM; 3 paratype workers, 1 paratype ♀♀ (from holotype nest) and 2 paratype workers each in ANIC, BMNH and MCZC; 2 paratype workers each in AMNH, CASC, JCUT, MHNG, MLAC and NMNH. OTHER MATERIAL: QUEENSLAND, Home Rule, 15°45'S, 145°17'E, c. 200m, 9-11.vi.1996, rf. edge (RJK & CJB accs 96.39, 40, 43) (w, ♀, ♂); Mt Hartley, 15°46'S, 145°19'E, 200-500m, 11.vi.1996, rf. (CJB & RJK acc. 96.45) (w); Pilgrim Sands, 1km NW of Cape Tribulation, 16°04'S, 145°28'E, 12-15.vi.1996 (RJK acc. 96.47) (w); Canopy Crane site, Cape Tribulation, 16°06'S, 145°27'E, 20-21.ii.2000 (RJK accs 2000.21, 23, 25, 28, 29, 31, 34, 39) (w); Oliver Ck, 16°08'S, 145°26'E, 14.vi.1996 (RJK acc. 96.53) (w); Mc Lean Ck, c. 19k SbyW of Cape Tribulation, 16°15'S, 145°26'E, 15.vi.1996 (RJK acc. 96.54) (w); O'Donoghues Falls, 16°26'S, 145°20'E, 150m, 15-16.v.1995 (GBM, Ford & Slaney) (w); Julatten, 16°37'S, 145°20'E, 2.v.1990 (BBL) (w); Black Mtn Rd, 4km N of Kuranda, 16°47'S, 145°38'E, 21.vii.1980 (RJK acc. 80.104) (w); Hann Tblld, 16°49'S, 145°11'E, 1000m, 11-13.xii.1995 (DJC) (w); Kennedy Hwy, 4km ESE of Kuranda, 16°50'S, 145°40'E, 12.v.1974 (RJK accs 74.25, 26) (w, ♀, ♂); Yarrabah, c. 11km E of Cairns, 16°56'S, 145°52'E, 22-24.vii.1980 (RJK acc. 80.111) (w); Bellenden Ker, Cableway Base Stn, 8-23.iv.1987 (E. Dahms & G. Sarnes) (w); Russel R., Bellenden Ker Landing, 1-9.xi.19981 (GBM & Earthwatch Exp.) (w); Atherton Tblld, Yungaburra, Paterson Ck, 17°16'S, 145°34'E, c.700m, 29.ix.2003 (RJK accs 2003.31, 32) (w); Atherton Tblld, xii.1983 (J. Sedláček) (w); The Boulders, c. 6km W of Babinda, 17°20'S, 145°52'E, 1990 (W. Travers) (w, ♀, ♂); Josephine Falls, 17°26'S,

145°51'E, 12.ii.1996 (GBM) (w); Seymour Ra., Garradunga, c. 7km N of Innisfail, 17°28'S, 146°01'E, <100m, 7.xi.1996, lowland rf. (JPH) (w); Palmerston NP, 17°37'S, 145°48'E, 350-400m, 2.i.1990, rf. (GBM) (w); Mission Beach-El Arish Rd, 17°52'S, 146°04'E, 4.xii.1995, lowland rf. (SKR #804) (w); c. 6km W of Stth Mission Beach, 17°56'S, 146°02'E, 5.vi.1996, lowland rf. (RJK acc. 96.17) (w, ♀); Kirrama Ra., c. 9km W of Kennedy, 18°12'S, 145°52'E, 31.x.1999, primary rf. (SKR #808, 809) (w); Hinchinbrook I., Gayundah Ck, 18°21'S, 146°14'E, <100m, 8-18.xi.1984 (GBM) (w); Townsville, JCU Campus, 21.viii.1995 (SKR #2) (w); 30km N of Giru, 19°16'S, 147°03'E, 800ft, 6.vi.1980, gallery forest (BBL) (w, ♀); Conway Ra., Brandy Ck Rd., 20°21'S, 148°43'E, 21-23.iv.1975 (RJK acc. 75.187/7) (w); Pioneer Ck Picnic Ground, Gargett, W of Mackay, 21°09'S, 148°43'E, riparian rf. (SKR #65-67, 74-97 3) (w, ♀, ♂); ditto, 26.ii.1996 (SKR #363) (w); ditto, 15.v.1996 (SKR #379) (w); ditto, 29.v.1996 (SKR #385, 387, 391, 393) (w); ditto, 21.vii.1996 (SKR #411) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 6.50, 5.54-6.75; HL 1.68, 1.43-1.72; HW 1.64, 1.43-1.65; C1 98, 94-100; SL 2.06, 1.75-2.12; SI 126, 119-130; PW 1.31, 1.09-1.40; MTL 2.40, 1.96-2.46 (19 measured).

Clypeus in profile almost straight, weakly rounding posteriorly into moderately impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with weakly raised margins; central area with weakly indicated frontal furrow. Sides of head in front of eyes almost straight, converging anteriorly and rounding into mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view breaking lateral cephalic outline. Ocelli lacking, relative positions indicated by shallow but distinct depressions in cephalic sculpturation. Pronotum in dorsal view widest across narrowly rounded or bluntly angular humeri. Mesosoma in lateral view evenly convex; promesonotal suture distinct; position of metanotal groove weakly indicated by shallow depression in lateral outline; propodeum armed with pair of rather strong, diverging, blunt spines; propodeal declivity almost vertical. Petiole with anterior face weakly convex, posterior face rather strongly convex; dorsum armed with four acute spines, medial pair closer to each other than to lateral spines; lateral pair more slender, longer and strongly diverging. Subpetiolar process acute anteriorly, bluntly angular posteriorly. Anterior face of first gastral segment lower than height of petiole, widely rounding onto dorsum of segment.

Mandibles finely, mostly longitudinally rugose. Head, mesosoma, petiole and gaster finely shagreened with numerous minute punctures and

piliferous pits. Sculpturation relatively fine on dorsa of head, mesosoma and gaster; intensity of sculpturation distinctly increasing laterally with sides of mesosoma distinctly reticulate and meso- and metapleurae rather strongly reticulate-rugose. Anterior face of petiole finely, mostly transversely reticulate dorsally, becoming reticulate-rugose on lower parts.

Distinctly hairy. Numerous curved and semierect hairs arising from mandibular masticatory borders, numerous, very short, appressed hairs towards mandibular bases. Anterior clypeal margin with several long, anteriorly directed setae medially and fringe of shorter setae decreasing in length laterally. Several medium to long, erect or somewhat curved, mostly paired hairs near anterior and basal clypeal borders, along frontal carinae and on vertex. Tuft of several hairs on summit of mesonotum with longest hairs reaching greatest diameter of eye in length. Numerous erect, medium length hairs on dorsal and ventral surfaces of gaster. Short, dense, appressed, decumbent or semierect pubescence on most body surfaces, distinctly diluted behind eyes towards occipital corners.

Colour: Black, including antennal scapes, coxae and tarsi. Trochanters, femora and tibiae distinctly light to medium reddish-brown with proximal ends of tibiae a shade darker.

Queen. Dimensions: TL c. 7.11-7.76; HL 1.65-1.87; HW 1.56-1.75; CI 93-98; SL 2.03-2.18; SI 123-130; PW 1.62-1.78; MT: 2.46-2.71 (5 measured). Apart from sexual characters, similar to worker except: pronotal humeri evenly rounded; mesoscutum distinctly wider than long with lateral margins converging anteriorly, forming narrowly rounded anterior margin; median line distinct; parapsides flat anteriorly, raised posteriorly; mesoscutum in profile with anterior margin widely rounded, dorsum flat. Mesoscutellum in profile weakly convex, marginally raised above dorsal plane of mesosoma; metanotal groove distinct. Propodeum armed with pair of distinct, dorsoventrally flattened, blunt spines. Lateral petiolar spines more slender and longer than dorsal pair. Sculpturation, pilosity and colour virtually identical to that in worker.

Males and immature stages (eggs, larvae in various stages of development and pupae) deposited in the QM spirit collection.

REMARKS. *Polyrhachis monteithi* appears to be one of the most common *Cyrtomyrma* species in rainforests of north Queensland. Like most other species of the group it builds nests of silk

and vegetation debris between the leaves of low rainforest trees and shrubs. It has also commonly been collected in relatively small rainforest patches and gallery forests along rivers and creeks. *Polyrhachis monteithi* is characterised by a distinctly hairy appearance that is shared by only one other Australian species, *P. pilosa*. *Polyrhachis monteithi* differs by its larger size (HL 1.43-1.72 versus 1.34-1.43 in *P. pilosa*) and distinct propodeal spines that are completely absent in *P. pilosa*. The known distribution of *P. monteithi* extends from about Cooktown south to Mackay, while *P. pilosa* is mostly a southern species extending from Mackay south to Taree in New South Wales and with only a few isolated collections from north Queensland. *Polyrhachis monteithi* was listed as *P. 'Cyrio 03'* by Kohout (2000: 196).

***Polyrhachis pilosa* Donisthorpe, 1938 (Fig. 4E-F)**

'Polyrhachis rastellata r. *laevior* var. *pilosa*' Forel, 1902: 527. (Unavailable name)

Polyrhachis (Cyrtomyrma) rastellata var. *pilosa* Donisthorpe, 1938: 256. First available use of '*P. rastellata laevior pilosa*' Forel (original specimens from Wollongbar, Richmond R. NEW SOUTH WALES (Froggatt) accepted as syntypes by Donisthorpe), (AMNH) (examined).

Polyrhachis pilosa Donisthorpe; Kohout & Taylor, 1990: 518. Raised to species.

Polyrhachis (Cyrtomyrma) pilosa Donisthorpe; Kohout, 2000: 195.

REMARKS. *Polyrhachis pilosa* is similar to *P. mackayi*, both having an evenly convex mesosomal dorsum, a completely unarmed propodeum and subequal petiolar spines. However, the former is easily distinguished by the cover of relatively long, erect hairs on the dorsum of the head and mesosoma (Fig. 4E-F). The main distribution of *P. pilosa* is similar to that of *P. mackayi*, reaching its southern limit at about Taree in northern New South Wales. In the north *P. pilosa* appears to be rather patchily distributed, with confirmed records from around Townsville and as far north and west as Forty Mile Scrub and Undara (ANA). It is a relatively common species within its main range and rather opportunistic in choosing its nesting sites. In recent years this species has become increasingly common in suburban parks and gardens, with their silk nests built not only between leaves, but also in various artificial cavities around houses, including door and window frames.

***Polyrhachis robsoni* sp. nov.**

(Fig. 3B, F-G)

MATERIAL. HOLOTYPE: QUEENSLAND, Daintree R. x-ing, 16°15'S, 145°23'E, 9.ix.2001, riparian rf., R.J. Kohout acc. 2001.26 (worker). **PARATYPES:** data (and nest) as for holotype (61 workers, 4 dealate ♀♀; ditto, 16.vi.1997, S.K. Robson #559 (47 workers, dealate ♀). Type deposition: Holotype (QMT99339), most paratype workers, 3 paratype ♀♀ (from holotype nest) and paratype workers and paratype ♀ in QM; 2 paratype workers, 1 paratype ♀ (from holotype nest) and 3 paratype workers in ANIC, 2 paratype workers (from holotype nest) in AMNH, BMNH, CASC, JCUT, MCZC, MHNG, MLAC and NMNH. **OTHER MATERIAL:** QUEENSLAND, Torres Strait, Thursday I., 10°35'S, 142°13'E, 27.ix.2003, monsoonal rf. (RJK aces 03.20, 22, 23, 24, 25, 26, 27) (w, ♀); Home Rule, 15°45'S, 145°17'E c. 200m, 9-11.vi.1996, rf. edge (CJB & RJK acc. 96.43) (w); Mt Hartley, 15°46'S, 145°19'E, 200-500m, 11.vi.1996, rf. (CJB & RJK acc. 96.45) (w); Shiptons Flat, 35km S of Cooktown, 15°47'S, 145°13'E, 16.vi.1997, second. rf. (SKR #591) (w); Pilgrim Sands, c. 1km NW of Cape Tribulation, 16°04'S, 145°25'E, 12-15.vi.1996 (RJK acc. 96.47) (w); Cape Tribulation N.P., 16°04'S, 145°27'E, 6.xii.1985, rf. (RJK acc. 85.6) (w, ♂); ditto, 19.x.1980, rf. (GBM et al.) (w); ditto, Canopy Crane site, 16°06'S, 145°27'E, 20-21.ii.2000, rf. (RJK & SKR acc. 2000.40) (w, ♀, ♂); Noah Ck, 13-19.x.1980 (GBM) (w); Oliver Ck, 16°08'S, 145°26'E, 14.vi.1996, rf. (RJK acc. 96.53) (w); Cow Bay, S of Cape Tribulation, 16°14'S, 145°28'E, 16.vi.1997, second. rf. (SKR #587) (w); Daintree R. x-ing, 16°15'S, 145°23'E, 16.vi.1997, riparian rf. (SKR #559.560) (w); Oak Beach, 16°36'S, 145°31'E, 10m, 18.v.1998, pyrethrum (GBM #1895) (w); Caravonica, 10km NW of Cairns, 16°51'S, 145°41'E, second. rf. & urban gardens (SKR numerous dates & accessions) (w, ♀, ♂); Cairns, Lake Placid, 16°52'S, 145°40'E, 18.x.1995 (SKR #57) (w); Cairns, Stratford Environ. Park, 16°53'S, 145°44'E, 13.i.1992 (RJK acc. 92.1) (w); Cairns, Botanic Gdns, 16°54'S, 145°45'E, (SKR numerous dates & accessions – see below under remarks) (w, ♀, ♂); ditto, 20.ii.2000 (RJK & SKR aces 2000.13, 14) (w); Yarrabah, c. 11km E of Cairns, 16°54'S, 145°51'E, 1-2.iii.1996, primary lowland rf. (SKR #371, 424) (w); Bellenden Ker, Cableway Base Stn, 8-23.iv.1987 (E. Dahms & G. Sarnes) (w); Russel R., Bellenden Ker Landing, 1-9.xi.1998 (GBM & Earthwatch Exp.) (w); Babinda, Double Barrel Ck, 17°21'S, 145°56'E, 26.i.1994, rf. (C.J. Hill); Garradunga, Seymour Ra., c. 7km N of Innisfail, 17°28'S, 146°01'E, <100m, 5-6.vi.1996, lowland rf., (RJK acc. 96.31) (w); nr Clump Point, NE of Tully, 30.iv.1969 (RWT acc. 69.103) (w); Mission Beach-El Arish Rd, 17°52'S, 146°04'E, 5.vi.1996, lowl. rf. (SKR #405) (w, ♀); ditto, 4.xii.1996, lowland rf. (SKR #803) (w); c. 2km W of Sth Mission Beach, 17°52'S, 146°05'E, 18-19.vii.1980, lowl. rf. (RJK acc. 80.90) (w); 10km WbyN of Sth Mission Beach, 17°56'S, 146°00'E, 18-19.vii.1980, lowl. rf. (RJK acc. 80.57) (w).

DESCRIPTION. Worker. Dimensions (holotype cited first): TL c. 5.85, 5.29-6.50; HL 1.47, 1.40-1.59; HW 1.50, 1.40-1.59; CI 102, 95-102; SL 1.75, 1.68-1.93; SI 117, 115-126; PW 1.18, 1.09-1.34; MTL 2.00, 1.87-2.21 (32 measured).

Clypeus in profile virtually straight, abruptly rounding posteriorly into moderately impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate, margins moderately raised; central area weakly concave with distinct frontal furrow. Sides of head in front of eyes weakly convex, converging anteriorly towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view breaking lateral cephalic outline. Ocelli lacking, relative positions of lateral ocelli indicated by shallow depressions in cephalic sculpturation. Pronotum in dorsal view widest just behind humeri that are toothed or, at least, angular. Mesosoma in profile strongly convex; promesonotal suture distinct; position of metanotal groove indicated by rather distinct depression; declivity very steep, almost vertical. Petiole with anterior face very weakly convex, posterior face moderately convex; dorsum armed with four spines; dorsal pair closer to each other than to lateral spines; lateral pair distinctly longer, more slender and rather strongly diverging.

Mandibles very finely, mostly longitudinally rugose with numerous, shallow punctures and piliferous pits. Head and gaster finely, dorsum of mesosoma and petiole more coarsely, shagreened. Sides of mesosoma rather strongly sculptured with intensity increasing laterally, meso- and metapleurae rather strongly reticulate-rugose. Anterior and posterior faces of petiole somewhat transversely wrinkled dorsally with sculpturation becoming coarsely rugose on lower parts. Numerous minute, mostly piliferous punctures over all body surfaces.

Mandibular masticatory border with numerous, curved and suberect hairs. Anterior clypeal margin medially with 1 long and a few shorter, anteriorly directed setae, fringe of shorter setae lining margin laterally. Several, mostly paired hairs arising near anterior and basal clypeal margins, along frontal carinae and on vertex. Generally only 2, erect, straight or undulated hairs, shorter than longest diameter of eye, on summit of mesonotum. Gastral dorsum with medium length, more-or-less erect hairs lining posterior margins of apical segments; hairs distinctly more abundant on venter of gaster. Abundant, mostly appressed hairs arising from

numerous punctures and pits on most dorsal body surfaces.

Colour. Black; very narrow band along mandibular masticatory borders, condylae and extreme tips of apical funicular segments, reddish-brown. Most of antennae and tarsi black or very dark brown. Trochanters, femora and tibiae generally light to medium reddish-brown with distal ends of femora and tibiae narrowly, and proximal ends of tibiae more widely, dark brown.

Queen. Dimensions: TL c. 6.60-8.82; HL 1.56-1.96; HW 1.47-1.96; CI 94-102; SL 1.78-2.28; SI 112-121; PW 1.43-2.00; MTL 2.03-2.74 (5 measured). Apart from sexual characters, resembling worker except: pronotal humeri narrowly rounded; mesoscutum only marginally wider than long; lateral margins converging anteriorly into rather widely rounded anterior margin; median line distinctly bifurcate posteriorly; parapsides weakly raised posteriorly; mesoscutum in profile with widely rounded anterior face, flat dorsally. Mesoscutellum weakly convex in profile, moderately raised above dorsal plane of mesosoma; metanotal groove distinct. Propodeum armed with pair of short, strongly upturned teeth that are completely lacking in all workers examined. Petiole in profile bi-convex and spines, notably lateral pair, distinctly shorter than in worker. Remaining features, including sculpturation and colour, as in worker.

Males and immature stages (eggs, larvae and pupae) in QM and JCUT collections.

REMARKS. *Polyrhachis robsoni* is a rather common north Queensland species distributed from Cooktown south to Mission Beach. It also occurs on Thursday Island in Torres Strait with this isolated population characterised by small workers (HL 1.40-1.47 versus 1.47-1.59 in mainland specimens). In addition, all Thursday Island colonies collected have shown polygyny and queen polymorphism. In two colonies the queens were distinctly both macro- and microgynous, while another colony contained only microgynous queens. Yet another colony included a graded series of numerous intermediates between the 'normal' macrogynous and microgynous queens seen in the other colonies. Queen size polymorphism in the mainland populations of *P. robsoni* is under investigation by Robson, Crozier, Henshaw & van Zweden at James Cook University, Townsville. Thirty seven nests of *P. robsoni* were collected by Robson at the Cairns Botanic Gardens (16°54'S, 145°45'E), of which 18 were polygynous. In

12 nests queens were of both sizes, in 4 they were only macrogynous and in the remaining 2 nests they were only microgynous. *Polyrhachis robsoni* is characterised by a highly arched mesosoma, toothed or distinctly angular pronotal shoulders and a completely unarmed propodeum. This species builds polydomous nests between leaves on the lower branches of trees and shrubs in lowland and riparian rainforests. Colonies on Thursday I. were found nesting in a small patch of dry monsoonal rainforest. This species was listed by Kohout (2000: 196) as both *P. 'Cyrto 04'* and *P. 'Cyrto 05'*.

***Polyrhachis rutila* sp. nov.**
(Fig. 3C, H-I)

MATERIAL. HOLOTYPE: QUEENSLAND, Davies Ck, c. 17km E of Mareeba, 17°01'S, 145°35'E, 15.vi.1980, rf. edge, R.J. Kohout acc. 80.19 (worker). PARATYPES: data as for holotype (9 workers). Type deposition: Holotype (QMT99340) and 3 paratypes in QM, 2 paratypes each in ANIC, BMNH and MCZC.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 4.94, 4.89-5.19; HL 1.31, 1.28-1.37; HW 1.31, 1.28-1.37; CI 100, 98-101; SL 1.43, 1.43-1.56; SI 109, 109-117; PW 0.97, 0.90-1.03; MTL 1.75, 1.68-1.81 (9 measured).

Anterior clypeal margin with central flange broadly emarginate medially and flanked by minute denticles. Clypeus in profile straight for most of its length, posteriorly curving abruptly into well impressed basal margin. Frontal triangle indistinct. Frontal carinae rather short, sinuate, with moderately raised margins; frontal furrow represented by more-or-less distinct, weakly raised, longitudinal carina. Sides of head in front of eyes almost straight, strongly converging into mandibular bases; behind eyes sides rounding into convex occipital border. Eyes relatively large, moderately convex, in full face view just reaching lateral cephalic outline. Median ocellus rather obscure, lateral ocelli lacking, relative positions indicated by shallow depressions in cephalic sculpturation. Pronotum in dorsal view with humeri rounded; greatest pronotal width at or near mid-length of segment. Mesosoma in profile with anterior face of pronotum convex; dorsum weakly concave with well impressed promesonotal suture; mesonotum convex; metanotal groove indistinct, indicated in some specimens by rather shallow depression in outline. Petiole with anterior face almost straight, posterior face moderately convex; dorsum armed with four short, acute, subequal teeth. Subpetiolar process

acute anteriorly, angular posteriorly. Anterior face of first gastral segment with base weakly concave, narrowly rounding onto dorsum of segment.

Mandibles very finely, mostly longitudinally rugose with numerous shallow punctures and piliferous pits. Head, mesosoma and gaster very finely shagreened, sculpturation on sides of mesosoma and petiole more distinct, reticulate on meso- and metapleurae and both faces of petiole. Rather dense piliferous pits and shallow punctures covering all body surfaces.

Mandibular masticatory borders with a few, rather short, curved hairs. Anterior clypeal margin usually with 1 long and 2 shorter, anteriorly directed setae medially and numerous shorter setae fringing margin laterally with their lengths decreasing towards mandibular bases. Several medium length, erect, mostly paired hairs arising near anterior and basal clypeal margins, along frontal carinae, on vertex and around apex of gaster. Hairs virtually absent from mesosoma, petiole and most of gastral dorsum. Very short, mostly appressed or decumbent pubescence arising from pits over all body surfaces, denser patches of more erect hairs on propodeum, petiole and venter of gaster.

Body generally light to medium reddish-brown with sides of mesosoma and petiole distinctly darker. Mandibular masticatory borders, condylae and gaster light yellow. Antennae reddish-brown with distal ends of scapes and apical segments of funiculi distinctly lighter. Anterior and basal clypeal margins, frontal carinae and genal carina narrowly lined with dark brown or black. Coxae and subpetiolar process light reddish-brown. Legs generally light yellow with proximal ends of tibiae and tarsi a shade darker.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis rutila* is known only from the type locality with all specimens collected by a single sweep of low foliage along the rainforest edge. This remarkable species is characterised by the outline of mesosoma which has a weakly concave summit and strongly impressed promesonotal suture. The brownish coloration of *P. rutila* is unlike all the other Australian *Cyrtomyrma* species that are jet-black. It is possible that the specimens of *P. rutila* are not fully pigmented, however, they appear fully sclerotised and the colour pattern is constant in

all individuals. *Polyrhachis rutila* was listed by Kohout (2000: 197) as *P. 'Cyrto' 07'*.

***Polyrhachis yorkana* Forel, 1915 (Fig. 4G-H)**

Polyrhachis (Cyrtomyrma) rastellata var. *yorkana* Forel, 1915: 110; Donisthorpe, 1938: 257. Syntype workers. Type locality: QUEENSLAND, Cape York Peninsula (E. Mjöberg), MIING, NRMS, BMNH, ANIC, QM (examined).

Polyrhachis yorkana Forel. Kohout & Taylor, 1990: 521. Raised to species.

Polyrhachis (Cyrtomyrma) yorkana Forel. Kohout, 2000: 196.

REMARKS. *Polyrhachis yorkana* is somewhat similar to *P. debilis* from New Guinea, with both displaying considerable variability in the development of the propodeal spines which range from inconspicuous tuberculae to short spines. However, they differ in numerous characters, including the shape of the head, which in *P. debilis* is as wide or even wider than long (CI 100-103), while in *P. yorkana* it is distinctly longer than wide (CI 96-98). In full face view, the eyes of *P. debilis* do not reach the sides of the head, while in *P. yorkana* they clearly break the cephalic outline. In lateral view, the pronotum is distinctly convex in *P. debilis* and rather flat in *P. yorkana*. In dorsal view, the pronotum in *P. debilis* is relatively narrow with evenly rounded shoulders, while in *P. yorkana* the pronotum is distinctly widest just behind the shoulders and, in the majority of specimens examined, the pronotal humeri are subangular (Fig. 4H) or distinctly angular. They also differ in their relative size, with *P. debilis* distinctly smaller (HL 1.34-1.47) compared to *P. yorkana* (HL 1.56-1.62). *Polyrhachis yorkana* is largely confined to the Wet Tropics of north Queensland, but it has occasionally been collected further north on Cape York Peninsula. It is an arboreal species with all colonies observed occupying polydomous silk nests built between the leaves of lowland rainforest trees.

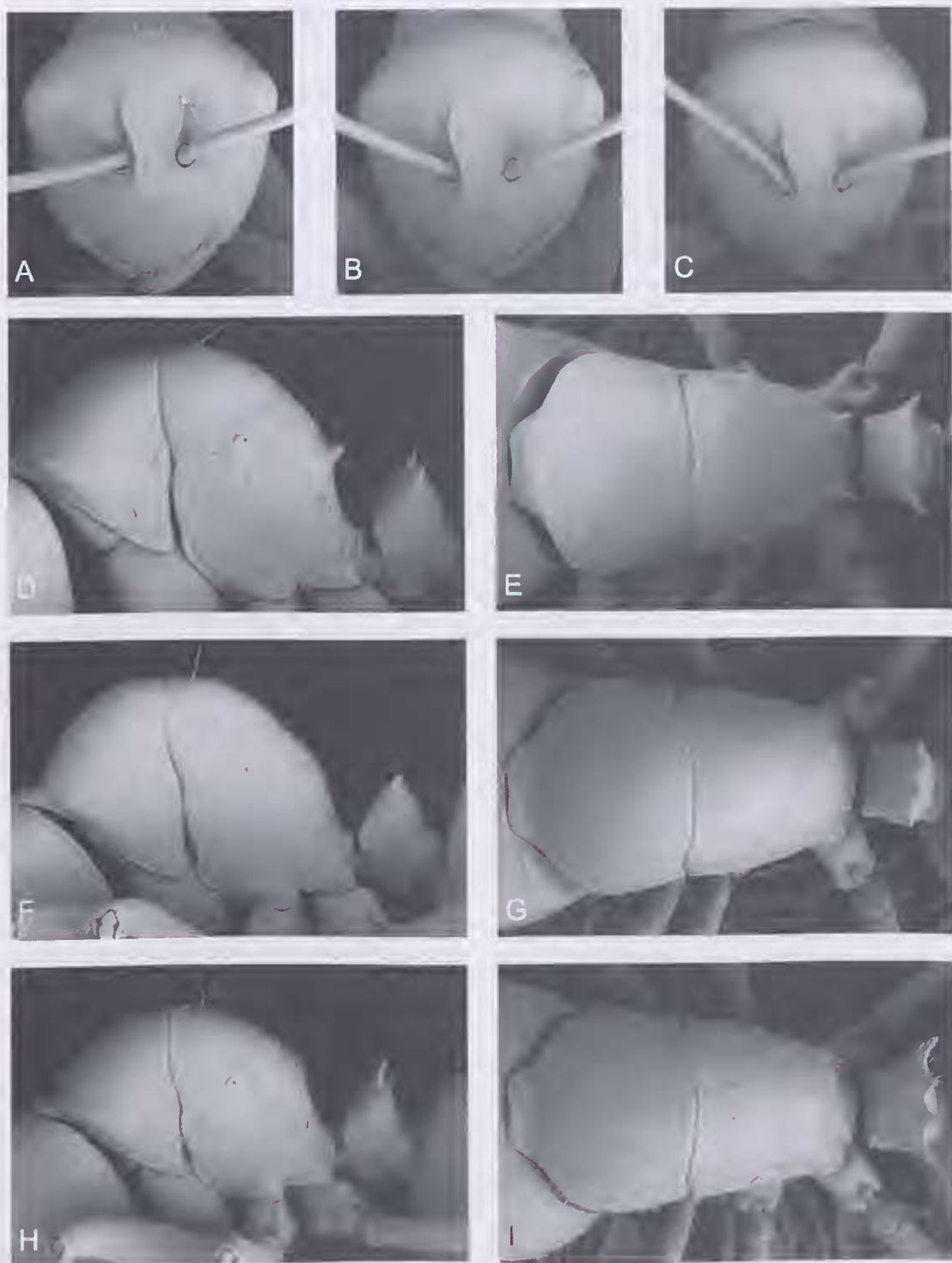


FIG. 1. *Polyrhachis* (*Cyrtomyrma*) species from Australia, Head in full face view (top); lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A, D-E, *P. abbreviata* sp. nov.; B, F-G, *P. brevinoda* sp. nov.; C, H-I, *P. decumbens* sp. nov.

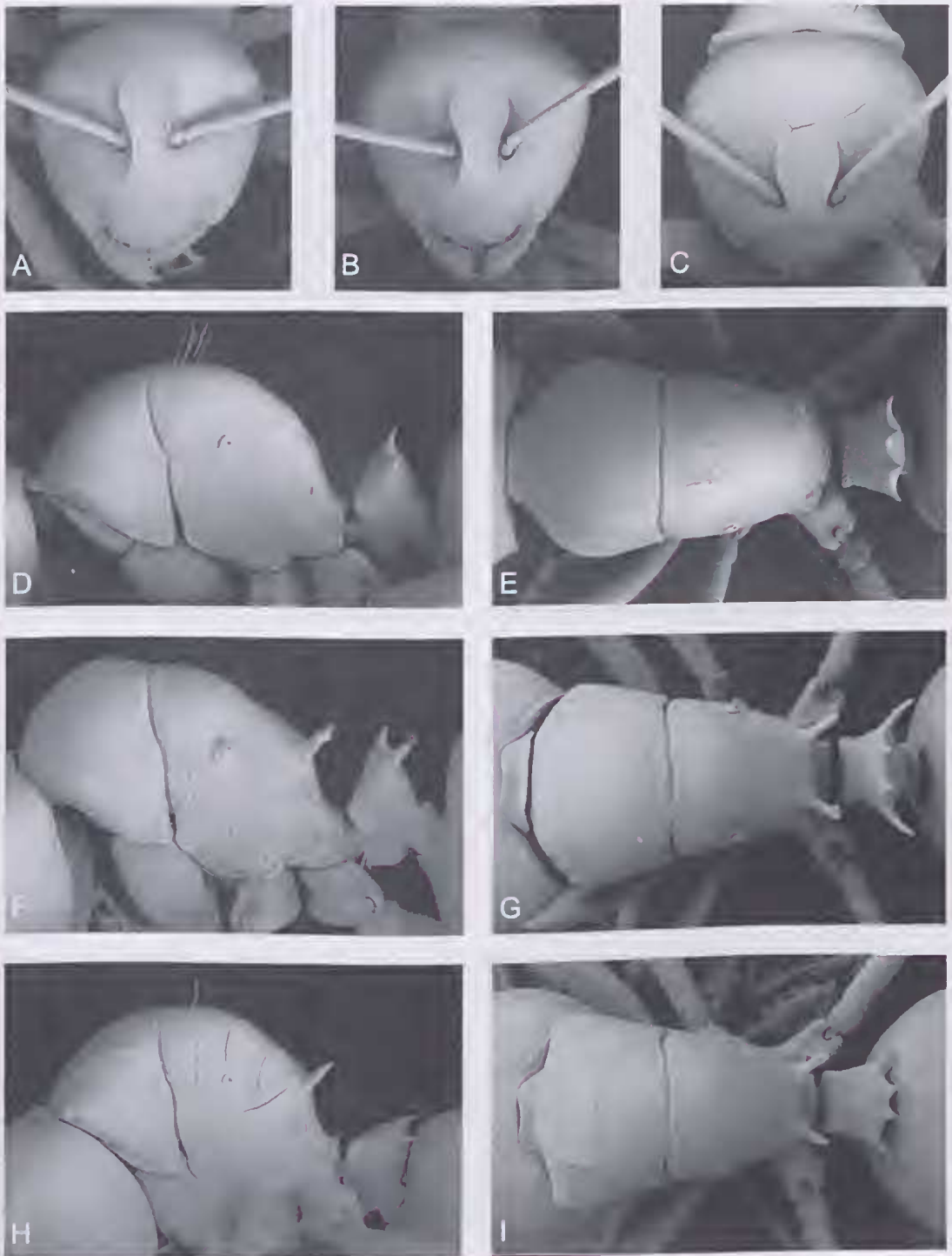


FIG. 2. *Polyrhachis* (*Cyrtomyrma*) species from Australia, Head in full face view (top); lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A, D-E, *P. delecta* sp. nov.; B, F-G, *P. expressa* sp. nov.; C, H-I, *P. hoelldobleri* sp. nov.

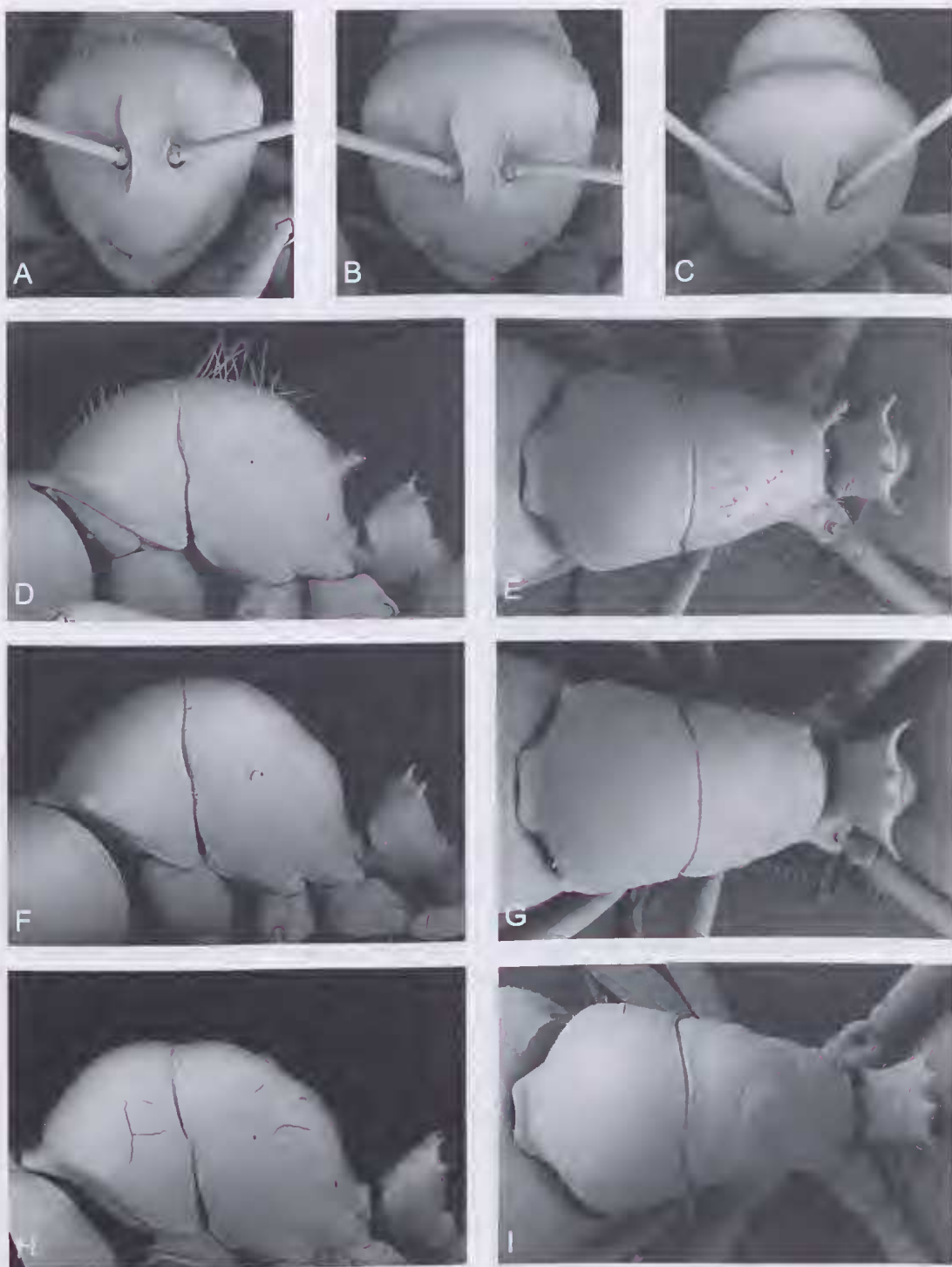


FIG. 3. *Polyrhachis* (*Cyratomyrma*) species from Australia, Head in full face view (top); lateral view of mesosoma and petiole (left); dorsal view of mesoma and petiole (right). A, D-E, *P. monteithi* sp. nov.; B, F-G, *P. ronsoni* sp. nov.; C, H-I, *P. rutila* sp. nov.

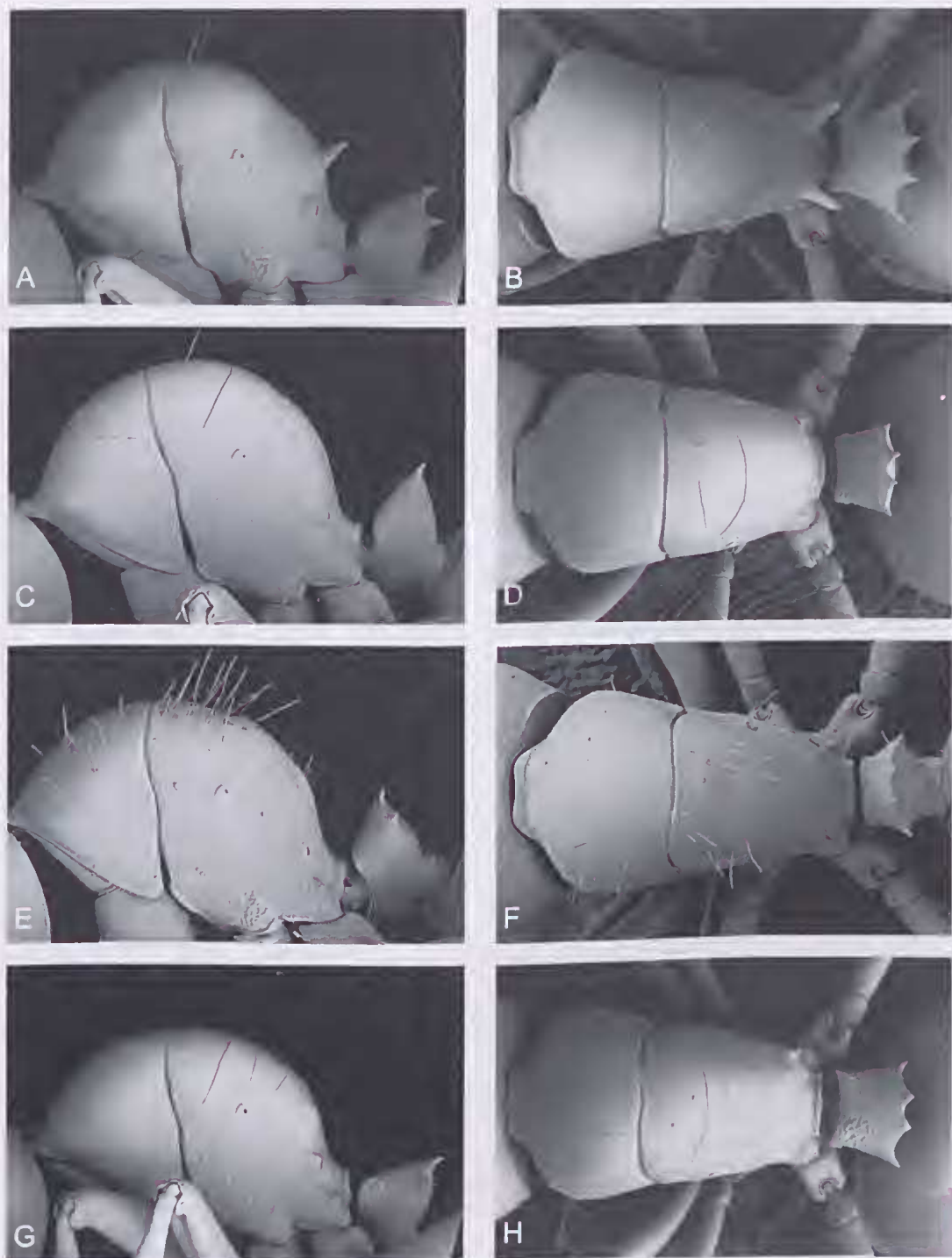


FIG. 4. *Polyrhachis* (*Cyrtomyrma*) species from Australia, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. australis* Mayr; C-D, *P. mackayi* Donisthorpe; E-F, *P. pilosa* Donisthorpe; G-H, *P. yorkana* Forel.

CHECKLIST OF *CYRTOMYRMA* SPECIES FROM BORNEO

The following list includes all *Cyrtomyrma* species known to occur on Borneo. It also includes *P. rastellata* (in parentheses in the list and key) that has been listed from Borneo by several authors but is, in my opinion, unconfirmed from the island.

P. achterbergi sp. nov.

P. bruehli sp. nov.

P. danum sp. nov.

P. laevisissima Fr. Smith

P. lepida sp. nov.

(*P. rastellata* (Latreille))

P. sulang sp. nov.

P. widodoi sp. nov.

KEY TO *CYRTOMYRMA* SPECIES FROM BORNEO (BASED ON WORKER CASTE)

1. Pronotal shoulders produced into distinct teeth (Figs 6B, 6D, 7F) 2

Pronotal shoulders without distinct teeth, narrowly or broadly rounded or bluntly angular (Figs 6F, 7B, 7D) . 6

2. Head, mesosoma, petiole and gaster finely shagreened, jet-black 3

Head, mesosoma and petiole distinctly reticulate-punctate, opaque, distinctly blue or with bluish sheen 4

3. Mesosoma in profile strongly convex anteriorly; mesonotum, propodeum and declivity descending posteriorly in an almost straight line (Fig. 6G); petiolar spines reduced to obtuse teeth *laevisissima* Fr. Smith

Mesosoma in profile moderately convex; mesonotum and propodeum descending posteriorly in weakly convex line before abruptly sloping into steep declivity (Fig. 7E); petiole with elongate lateral spines *sulang* sp. nov

4. Propodeum armed with pair of short spines (Fig. 6C); petiole with pair of elongated lateral spines, dorsal pair lacking (Fig. 6D) *bruehli* sp. nov.

Propodeal dorsum unarmed (Fig. 6A); petiole with pair of dorsal blunt teeth and pair of distinctly longer lateral spines (Fig. 6B) 5.

5. Anterior clypeal margin with central, blunt, projecting tooth (Fig. 5A) *achterbergi* sp. nov.

Anterior clypeal margin deeply emarginate medially (Fig. 5B) *widodoi* sp. nov.

6. Larger species (HL >1.65); pronotal shoulders widely rounded (Fig. 6F); petiole with sides more-or-less parallel, spines reduced to minute denticles (Fig. 6F) *danum* sp. nov

Smaller species (HL <1.65); pronotal shoulders narrowly rounded or angular (Fig. 7B, D); petiole with sides diverging, spines acute (Fig. 7B, D) 7

7. Lateral petiolar spines distinctly longer than dorsal pair (Fig. 7B); legs dark reddish-brown ... *lepida* sp. nov.

Petiolar spines subequal or lateral pair shorter than dorsal pair (Fig. 7D); legs mostly orange or light reddish-brown (*rastellata* (Latreille))

Polyrhachis achterbergi sp. nov. (Figs 5A, 6A-B)

MATERIAL. HOLOTYPE: EAST MALAYSIA, SABAH, Danum Valley Conservation Area, 04°57'N, 117°48'E, Segama R. trail, c. 150m, rf., 11.xi.2000, R.J. Kohout acc. 2000.217 (worker). PARATYPES: data as for holotype (2 workers); nr Danum Valley Field Centre, c. 150m, 20-26.iii.1987, Malaise Trap 5, C.van Achterberg (3 workers); ditto, C.van Achterberg & D. Kennedy (2 workers); ditto, Malaise Trap 10, C.van Achterberg (worker); ditto, 14.x.1999, fogging, L. Ellwood (T1 - fog 4-2; fog 4-17; fog 4-20; fog 4-24) (5 workers). Type deposition: Holotype (QMT99341) and 1 paratype in QM; 2 paratypes in ANIC, BMNH, MCZC and RMNH; 1 paratype each in CASC and ITBC.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 8.06, 7.46-8.06; HL 2.25, 2.12-2.25; HW 2.28, 2.15-2.28; CI 101, 101-105; SL 2.09, 2.03-2.18; SI 92, 91-99; PW 1.78, 1.68-1.81; MTL 2.71, 2.62-2.81 (14 measured).

Anterior clypeal margin convex with central, blunt, projecting tooth. Clypeus in profile very weakly sinuate, almost straight, with weakly impressed basal margin; laterally basal margin indicated by very distinct line. Frontal triangle weakly impressed. Frontal carinae relatively short, margins only weakly raised; central area wide with distinct, flat frontal line. Head very broad, distinctly wider than long. Sides of head almost straight in front of eyes; widely rounding behind eyes into broad, medially concave occipital margin. Lateral carina separating gena from ventral parts of head lacking. Eyes relatively small, rather flat, situated well forward and inward from occipital corners; in full face view eyes not reaching lateral cephalic outline. Median ocellus distinct; lateral ocelli absent, relative positions indicated by slightly raised cephalic sculpture. Pronotum in dorsal view with humeri armed with strong, blunt teeth. Mesosoma in profile convex anteriorly, summit relatively flat, posteriorly sloping in weakly convex curve into very short propodeal declivity; promesonotal suture distinct; metanotal groove lacking. Petiole with weakly convex anterior, and virtually flat posterior face; dorsum armed with pair of broad-based, blunt teeth and pair of longer, slender lateral spines. Subpetiolar process angular anteriorly, widely rounded posteriorly. Anterior face of first gastral

segment relatively low and flat, widely rounding onto dorsum of segment.

Mandibles very finely, mostly longitudinally, striate-rugose with numerous shallow piliferous pits. Clypeus with smooth, median line, running from anterior clypeal process towards base, reaching weakly impressed frontal triangle. Most of head, mesosoma and petiole distinctly and regularly reticulate-punctate. Gaster very finely shagreened.

Several short, curved hairs present on mandibular masticatory borders, a number of short, appressed hairs arising from pits towards mandibular bases. Only a few, rather short, anteriorly directed setae fringing anterior clypeal margin. Short to very short, erect hairs, mostly in pairs, near anterior and basal clypeal margins and along frontal carinae; 1 or 2 pairs of short hairs on summit of mesosoma. Gaster with several medium length hairs lining posterior margins of apical segments, with hairs more abundant on venter. Extremely short, closely appressed pubescence over all body surfaces, most distinct on gaster.

Head, mesosoma and petiole medium to deep blue with weak metallic sheen. Mandibles black with small reddish patch near masticatory borders. Antennae brown with distal end of scapes blotched reddish-brown. Funicular segments very narrowly at their joints, and tips of apical segments widely, yellowish-brown. Coxae of front legs and subpetiolar process medium reddish-brown, coxae of mid- and hind legs a shade lighter; rest of legs very bright, light to medium orange; proximal ends of tibiae and tarsi very dark brown to black. Gaster very dark reddish-brown, almost black in some specimens, with posterior margins of segments diffusely reddish-brown.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis achterbergi* is known only from the type locality where it is sympatric with *P. bruehli* and *P. widodoi*, both described below. Nothing is known about its nesting habits but most specimens have been collected by fogging or Malaise traps and it is apparently arboreal, probably building nests high in the rainforest canopy. *Polyrhachis achterbergi* is a spectacular species, the blue colour of the head, mesosoma and petiole, strongly contrasting with the orange appendages. It is similar to *P. bruehli* (Fig. 6C-D) and *P. widodoi*, and also to *P. vitalisi* (Fig. 7G-H), described by Santschi (1920: 567) from Laos. All four species share the dense reticulate-punctate sculpturation of the head, mesosoma and petiole but only *P. achterbergi*,

P. bruehli and *P. widodoi* have the same striking colour scheme. *Polyrhachis achterbergi* differs from *P. bruehli* by the absence of propodeal spines and from *P. widodoi* by shape of the anterior clypeal margin. In *P. achterbergi* the margin has a central, blunt, projecting tooth (Fig. 5A), while in *widodoi* it is deeply emarginate medially (Fig. 5B).

***Polyrhachis bruehli* sp. nov.**
(Fig. 6C-D)

MATERIAL. HOLOTYPE: EAST MALAYSIA, SABAH, Danum Valley, i-iv.1999, fogging, C. Brühl (worker). Type deposition: Unique holotype (QMT99342) in QM.

DESCRIPTION. *Worker.* Dimensions of holotype: TL c. 6.55; HL 1.78; HW 1.81; CI 102; SL 1.78; SI 98; PW 1.40; MTL 2.34.

Anterior clypeal margin broadly and shallowly emarginate medially; emargination flanked by distinct, anterolaterally projecting, acute teeth. Clypeus in profile straight with basal margin flat; shallow median depression on clypeus near basal margin, may be due to partly collapsed cuticula as holotype is probably not fully sclerotised. Frontal triangle shallowly impressed; frontal carinae sinuate, relatively short with only weakly raised, posteriorly converging margins; central area wide with distinct longitudinal furrow terminating in shallow depression on vertex that indicates position of median ocellus. Head broad, wider than long. Sides of head in front of eyes almost straight, converging towards mandibular bases; behind eyes sides rounding into broad, medially weakly concave occipital margin. Eyes weakly convex, situated well forward and inward from occipital corners; in full face view eyes not reaching lateral cephalic outline. Ocelli lacking. Pronotal humeri armed with short, acute spines; lateral margins below spines narrowly emarginate. Mesosoma in profile convex; promesonotal suture distinct; metanotal groove lacking; propodeum armed with pair of short, acute, triangular, upturned spines. Petiole narrow in profile; dorsum armed with long, posteriorly curved, lateral spines; dorsal spines lacking. Anterior face of first gastral segment shallowly concave at base.

Mandibles very finely, mostly longitudinally rugose with numerous piliferous pits. Clypeus with smooth, weakly indicated, median line, running from anterior clypeal process towards base, reaching shallowly impressed frontal triangle. Body sculpturation consisting of regular reticulate-punctation, uniformly distributed on

head, mesosoma and petiole. Gaster very finely shagreened.

A few, short, curved and semirect hairs on mandibular masticatory borders. Anterior clypeal margin medially with 1 long and 2 shorter, anteriorly directed setae; fringe of shorter setae lining margin laterally. Medium length, erect hairs, mostly in pairs, near anterior and basal clypeal margins and along frontal carinae. Gaster with several medium length hairs lining posterior margins of apical segments, hairs more abundant on venter. Hairs completely absent from vertex, mesosoma and petiole. Extremely short, closely appressed pubescence distributed sparingly over all dorsal body surfaces.

Body generally reddish-brown with dorsum of head, mesosoma and petiole with distinct blue sheen. Mandibles, antennae, including condylae, coxae and legs very light yellow; mandibular teeth and apical segments of tarsi a shade darker.

REMARKS. The holotype is the only known specimen of this remarkable species. It appears to be not fully pigmented and sclerotised, with the gaster and possibly also the median portion of clypeus collapsed. *Polyrhachis bruehli* resembles *P. achterbergi* and *P. widodoi* but differs from both by the presence of short, but distinct propodeal spines and by the configuration of the petiolar spines. It also differs in the shape of anterior clypeal margin that is shallowly and widely emarginate with the emargination flanked by distinct, anterolaterally projecting, acute teeth.

***Polyrhachis danum* sp. nov.**
(Fig. 6E-F)

MATERIAL. HOLOTYPE: EAST MALAYSIA, SABAH, Danum Valley Conservation Area, 04°57'N, 117°48'E, Segama R. Trail, rf., 11.xi.2000, R.J. Kohout acc. 2000.217 (worker). **PARATYPES:** data as for holotype (21 workers, 1 dealate ♀); ditto, Nature Trail, rf., 11.xi.2000, RJK acc. 2000.227 (2 workers); ditto, Western Trail, rf., 12.xi.2000, RJK acc. 2000.237 (12 workers). Type deposition: Holotype (QMT99343), most paratype workers and paratype ♀ in QM; 2 paratypes each in AMNH, ANIC, BMNH, BPBM, CASC, ITBC, MCZC and NMNH. **OTHER MATERIAL:** EAST MALAYSIA, SABAH, Maliau Basin Cons. Area, Agathis Camp, 04°41'S, 116°54'E, c.500m, 16-19.iii.2005, rf. (RJK & Lina Thomas acc. 05.87 (w, ♀); Sepilok For. Reserve nr Sandakan, 10-12.vi.1968, rf. (RWT accs 68.408, 428, 441) (w); Lambuk Rd, 45mi ex Sandakan (Lungmanis), 12.-13.vi.1968 (RWT acc. 68.452) (w); W coast Residency Ranau, 8km N of Poring Hot Springs, 500m, 8-18.x.1959 (T.C. Maa) (w); nr Danum Valley Field

Centre, c. 150m, 11.& 14.-20.iii.1987, Malaise Trap (C.van Achterberg) (w); Danum Valley, 04°57'N, 117°48'E, 1994 (Maryati Mohamed) (w); ditto, fogging, xi.1995 (E. Widodo) (w); ditto, vi.1996 (E. Widodo) (w); Deramakot Forest Reserve, i-v.1998 (C. Brühl) (w); Forest Camp, 19km N of Kalabakan, 180m, 12.& 22.x.1962 (Y. Hirashima) (w); Quoin Hill, Tawau, 9.viii.1962 (Y. Hirashima) (w). **SARAWAK:** Bau Distr., Bidi, 90-240m, 3.ix.1958 (T.C. Maa) (w). **BRUNEI:** Temburong Distr., Kuala Belalong Field Study Centre, 15.iv.1993, rf. (RJK acc. 93.5) (w); Belait Distr., Kuala Ingai, Ulu Belait, 12.-15.vii.1994, rf. (RJK acc. 94.114) (w); Bukit Sulang, nr Lamunin, 20.viii-10.ix.1982, fogging (N.E. Stork, B.M. 1982-388) (w). **INDONESIA, KALIMANTAN,** 17-46km W of Batulitjin, 28.vi.- 2.vii.1972, lowl. rf. (W.L. Brown) (w); Gunning Palung Nat. Pk, Cabang Panti Res. Stn, 01°15'S, 110°5'E, 100-400m, 15.vi-15.viii.1991, primary rf. (Darling, Rosichon & Sutrisno) (w).

DESCRIPTION. Worker. Dimensions (holotype cited first): TL c. 7.76, 6.60-7.76; HL 1.84, 1.65-1.87; HW 1.62, 1.37-1.62; Cl 88, 81-88; SL 2.50, 2.18-2.50; SI 154, 150-164; PW 1.37, 1.22-1.37; MTL 3.12, 2.68-3.17 (31 measured).

Clypeus in profile weakly, evenly convex with basal margin weakly impressed. Frontal triangle indistinct. Frontal carinae sinuate with raised margins; central area concave with weakly indicated frontal furrow. Sides of head in front of eyes weakly convex, converging anteriorly towards mandibular bases; behind eyes sides rounding into highly convex occipital margin. Eyes relatively large, convex, in full face view clearly breaking lateral cephalic outline. Ocelli lacking, position of median ocellus marked by distinct pit; relative positions of lateral ocelli poorly indicated. Pronotum in dorsal view with humeri widely rounded; greatest pronotal width at mid-length of segment. Mesosoma in profile convex; promesonotal suture moderately strongly impressed; position of metanotal groove indicated by very weak impression; propodeum widely rounding into virtually vertical declivity. Petiole low, anterior, posterior and dorsal faces flat; dorsal spines reduced to minute denticles. Subpetiolar process rather long, acute anteriorly, obtusely angular posteriorly. Anterior face of first gastral segment in lateral view relatively low, widely rounded.

Mandibles finely, longitudinally rugose with numerous piliferous pits. Head, mesosoma and gaster rather smooth and polished, very finely, microscopically and uniformly shagreened with numerous very shallow punctures. Anterior face of petiole finely, transversely wrinkled.

Mandibles with numerous, relatively short, erect to semierect hairs. A few, medium length, anteriorly directed setae medially on anterior elypeal margin, several shorter setae lining margin laterally. Rather short, paired, erect hairs near anterior and basal elypeal margins and along frontal carinae; pair of longer, somewhat curved hairs on summit of mesosoma. A few, isolated, long, erect hairs anteriorly on fore coxae and along ventral surfaces of trochanters and femora, hairs absent in some specimens. Medium length hairs along posterior margins of apical gastral segments, hairs more abundant on gastral venter.

Colour. Black with mandibular masticatory borders, condylae and extreme tips of apical funicular segments reddish-brown. Legs, including trochanters, red or reddish-brown with distal ends of femora very narrowly darker; proximal ends of tibiae and tarsi very dark brown or black.

Queen. Dimensions (paratype queen cited first): TL c. 8.32, 8.21; HL 1.87, 1.81; HW 1.59, 1.62; CI 85, 89; SL 2.37, 2.50; SI 149, 1.54; PW 1.72, 1.72; MTL 3.03, 3.15 (2 measured). Apart from sexual characters, closely resembling worker except: pronotal humeri widely rounded; mesoscutum slightly wider than long with lateral margins distinctly converging anteriorly, forming narrowly rounded anterior margin; median line weakly indicated, very short; parapsides rather flat; in profile mesoscutum with dorsum gently curved anteriorly, rather flat posteriorly. Mesoscutellum convex, slightly elevated above dorsal plane of mesosoma; metanotal groove distinct, well impressed. Propodeal dorsum convex in profile, evenly rounded into vertical declivity. Very fine, microscopic sculpturation, rather sporadic dorsal pilosity and polished appearance as in worker.

Males and immature stages unknown.

REMARKS. *Polyrhachis damm* is a relatively common species at suitable, lowland rainforest localities. It is apparently endemic to Borneo and has been previously misidentified as *P. semiinermis*, a very similar species described by Donisthorpe from the Philippines. *Polyrhachis damm* also resembles *P. brevinoda* from north Queensland, described above. Distinguishing characters of all three species are discussed in the remarks section for *P. brevinoda*.

***Polyrhachis laevis* Fr. Smith, 1858**
(Fig. 6G-H)

Polyrhachis laevis Fr. Smith, 1858: 64, pl. 4, fig. 42. Holotype worker. Type locality: MYANMAR (= Burma) (Waring), BMNH (examined).

Polyrhachis (Cyrtomyrma) laevis Fr. Smith; Wheeler, 1919: 137; Emery, 1925: 207; Donisthorpe, 1938: 252, fig. 5.

REMARKS. *Polyrhachis laevis* closely resembles *P. sulang* described below, but the latter differs in having a distinctly lower and more evenly convex mesosomal profile (cf Figs 7E, 6G). They also differ in the configuration of the petiolar spines, with those in *P. laevis* reduced to obtuse teeth, while the lateral teeth in *P. sulang* are distinctly elongate. The legs in *P. laevis* are distinctly light red, while in *P. sulang* the legs are darker with black coxae. *Polyrhachis laevis* is distributed from Myanmar and India to Thailand, Malaysia, Sumatra and Java, with more recent records from Borneo (Maliau Basin, Sabah).

***Polyrhachis lepida* sp. nov.**
(Fig. 7A-B)

MATERIAL. HOLOTYPE: EAST MALAYSIA, SABAH, Kinabalu Park, Poring, 06°02'N, 116°43'E, c. 500m, 30.x.2000, rf edge, R.J. Kohout acc. 2000.181 (worker). PARATYPES: data as for holotype (11 workers). Type deposition: Holotype (QMT99344) and 2 paratypes in QM; 2 paratypes each ANIC, BMNH and MCZC; 1 paratype each AMNH, ITBC and NMNH. OTHER MATERIAL: EAST MALAYSIA, SABAH, Maliau Basin Cons. Area, Ginseng Camp, 04°44'S, 116°55'E, c. 700m, 27.ii-11.iii.2005 (RJK & Effazilla Waty acc. 05.61) (w, ♀); ditto, Agathis Camp, 04°41'S, 116°54'E, c. 500m, 16-19.iii.2005 (RJK & Lina Thomas acc. 05.84) (w); Kinabalu Park, Poring, 06°02'N, 116°43'E, >650m, 19.iii.1993 & 16.ii-7.iii.1997, fogging (A. Floren) (w); Sepilok Forest Reserve, 05°52'N, 117°56'E, 8.xi.2000 (RJK acc. 2000.209) (w); ditto, 27.viii.1995 (Sk. Yamane) (w); Crocker Ra. NP, Mahua Falls nr Tambunan, 05°47'N, 116°24'E, c. 950m, 4.xi.2000 (RJK acc. 2000.193) (w, ♂); Danum Valley Field Centre, 04°57'N, 117°48'E, c. 150m, 11-13.xi.2000 (RJK accs 2000.211, 237) (w, ♀); ditto, c. 150-240m, 24.ii-18.iii.1987, Malaise trap (C.v. Achterberg) (w, ♀); ditto, xi.1995, fogging (E. Widodo) (w); nr Long Pa Sia (East), c. 1000m, 1-13.iv.1987, Malaise trap (C.v. Achterberg) (w, ♀); Forest Camp, 19km N of Kalabakan, c. 180m, 18.x.1962 (Y. Hirashima) (w); Forest Camp, 9.8km SW of Tenom, 18.xii.1962 (Y. Hirashima) (w). BRUNEI: Belait Distr., 1-2km SE of Melilas Longhouse, 16.vii.1994 (RJK acc. 94.120) (w, ♀); Ulu Belait, Kuala Ingai, 12-15.vii.1994 (RJK 94.114). INDONESIA, KALIMANTAN TIMUR, Bukit Sochar (UNMUL forest), 12.viii.1992 (Sk. Yamane) (w); Teluk Kabah Kutai N.P., 17.ix.1993 (Sk. Yamane) (w). KALIMANTAN SELATAN, 22km E of Banjarmasin, kerangas woodland, 25.vi.1972 (W.L. Brown) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.90, 5.64-6.00; HL 1.47, 1.40-1.50; HW 1.34, 1.28-1.37; CI 91, 89-93; SL

1.78, 1.68-1.81; SI 133, 128-136; PW 1.15, 1.09-1.18; MTL 2.03, 1.96-2.12 (12 measured).

Clypeus in profile almost straight anteriorly, posteriorly rounding into moderately impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with weakly raised margins; central area weakly concave with poorly defined, short furrow. Sides of head in front of eyes very weakly convex, converging anteriorly; behind eyes rounding into convex occipital margin. Eyes in full face view clearly breaking lateral cephalic outline. Ocelli lacking; relative positions of lateral ocelli indicated by weak punctures in cephalic sculpture. Pronotum in dorsal view with greatest width across narrowly rounded or subangular humeri. Mesosoma in profile with pronotum convex anteriorly, mesonotum and propodeum weakly convex; promesonotal suture distinct; position of metanotal groove indicated by weak impression in lateral outline; propodeum unarmed or with rudimentary tubercles in some specimens; propodeal dorsum rounding rather abruptly into steep declivity. Petiole with anterior face almost straight, posterior face convex; dorsum armed with pair of short, broad-based dorsal teeth and pair of distinctly longer and slender lateral spines. Subpetiolar process acute anteriorly, obtusely angular posteriorly. Anterior face of first gastral segment in lateral view relatively low, straight, narrowly rounding onto dorsum of segment.

Mandible very finely, mostly longitudinally rugose with numerous piliferous pits. Dorsa of head, mesosoma and gaster finely and uniformly shagreened, rather polished, with numerous shallow punctures. Intensity of mesosomal sculpturation increasing laterally, becoming coarsely reticulate-rugose with meso- and metapleurae distinctly rugose. Petiole finely transversely wrinkled, more rugose around base.

Mandibles with several semicrect and curved, short hairs, notably towards outer margins and masticatory borders. Single pair of relatively long, anteriorly directed setae medially on anterior clypeal margin, a few distinctly shorter setae lining margin laterally. Several pairs of relatively short hairs arising near anterior and basal clypeal margins, along frontal carinae and on vertex. Anterior face of fore coxae, trochanters and proximal ends of fore femora on ventral aspect with a few longer hairs. Gaster with relatively few erect hairs lining posterior margins of apical segments. Whole body with extremely short appressed hairs arising from numerous shallow punctures.

Colour: Black; mandibular teeth, condylae and extreme tips of apical funicular segments reddish-brown. Legs, including trochanters, light to medium reddish-brown with distal ends of femora and tibiae very narrowly, and proximal ends of tibiae widely, black. Coxae and tarsi black.

Queen. Dimensions: TL c. 6.80-7.61; HL 1.50-1.65; HW 1.40-1.56; CI 91-94; SL 1.78-1.93; SI 120-129; PW 1.43-1.72; MTL 2.18-2.43 (7 measured). Apart from sexual characters, very closely resembling worker except: pronotal humeri rounded; mesoscutum wider than long with lateral margins converging anteriorly, anterior margin narrowly rounded; median line weakly indicated, short; parapsides rather flat; mesoscutellum in profile weakly convex, only marginally elevated above dorsum of mesosoma; metanotal groove distinct; propodeum in some specimens with indistinct, rudimentary tubercles; propodeal dorsum convex or almost straight in profile, descending into oblique declivity in rather blunt angle.

Males deposited in the QM collection. Immature stages unknown.

REMARKS. *Polyrhachis lepida* is apparently endemic to Borneo and distributed throughout the island. It is a relatively common species along the edges of rainforest clearings from the lowlands to higher altitudes. They usually build nests between leaves in the lower arboreal zone. However, one nest was located in a hollow internode of a dry bamboo stem lying on the ground. *Polyrhachis lepida* is somewhat similar to *P. rastellata*, but can be distinguished by its generally smaller size, distinctly more convex occiput and longer antennal scapes (SI 128-136 versus 111-123 in *P. rastellata*). They also differ in the configuration of the petiolar spines with the lateral pair in *P. lepida* distinctly longer than the dorsal pair. In contrast, the petiolar spines in *P. rastellata* are subequal or the lateral pair is somewhat shorter than the dorsal pair. The two species also differ in the colour of their legs with those of *P. lepida* consistently darker.

Polyrhachis rastellata (Latreille, 1802) (Fig. 7C-D)

Formica rastellata Latreille, 1802: 130. Holotype queen. Type locality: 'INDES ORIENTALES' (type apparently lost). *Polyrhachis rastellata* (Latreille). Fr Smith, 1858: 59. *Polyrhachis* (*Cyrtomyrma*) *rastellata* (Latreille). Forel, 1915: 107; Donisthorpe, 1938: 254.

REMARKS. The holotype queen of *P. rastellata* was apparently lost "a long time ago" (J. Casevitz Weulersse, MNHN, pers. comm.) and during the

past two centuries more than twenty infraspecific names have been connected to this name. My current interpretation of this species is based upon specimens from India that Donisthorpe considered to be *P. rastellata* ['Described from an Indian specimen (*Wroughton*)' (Donisthorpe, 1938)]. However, the type locality of *P. rastellata* is the 'Indes orientales' or the East Indies, and probably corresponds to modern day Malaysia and Indonesia. Consequently, interpreting *P. rastellata* based on Indian material may well be incorrect. It would be highly desirable to establish the nomenclatural stability of this species by the designation of a neotype. However, I believe that such an action would not be appropriate here, as I have not attempted a revision of the Asian fauna of the subgenus.

In the literature, *P. rastellata* has been reported to occur over most of south-east Asia and south across Indonesia and New Guinea to northern Australia. However, many of these records are linked to the numerous infraspecies connected to that name. Several authors, including Mayr (1872: 138) and Wheeler (1919: 136) listed *P. rastellata* from Borneo and various authors have listed it from New Guinea. Consequently, I have included it in the lists and keys of species from both regions. However, I have not seen any Bornean or New Guinean material satisfactorily comparable with the specimens from India that Donisthorpe considered to be *P. rastellata* and I believe that the nominal form is restricted to India, Sri Lanka, Myanmar and former Indochina, including Sumatra and possibly Java.

Polyrhachis rastellata resembles *P. lepida*, described above, with their main distinguishing characters listed under the latter.

***Polyrhachis sulang* sp. nov.**
(Fig. 7E-F)

MATERIAL. HOLOTYPE: BRUNEI, Tutong Distr., Bukit Sulang nr Lamunin, 20.viii.-10.ix.1982, fogging, N.E. Stork (B.M.1982-388) (worker). PARATYPE: data as for holotype (1 worker). Type deposition: Holotype in BMNH, paratype in QM.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.44, 5.85; HL 1.43, 1.50; HW 1.40, 1.47; CI 98, 98; SL 1.56, 1.62; SI 111, 110; PW 1.15, 1.22; MTL 1.93, 1.96 (2 measured).

Clypeus in profile evenly convex; basal margin only very weakly impressed medially. Frontal triangle shallowly impressed. Frontal carinae sinuate with very weakly raised margins; carinae widely separated, central area relatively broad

and flat, with distinct frontal furrow. Sides of head in front of eyes weakly convex, converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes weakly convex, in full face view not or only just reaching lateral cephalic outline. Ocelli lacking, relative position of median ocellus indicated by very shallow depression in sculpture. Pronotum in dorsal view with humeri produced anterolaterally into strong, triangular teeth. Mesosoma in profile convex anteriorly; promesonotal suture distinct; mesonotum and propodeum weakly convex; metanotal groove indistinct dorsally, laterally consisting of a short furrow above spiracle. Propodeum unarmed, declivity rather short, oblique. Petiole with anterior face weakly convex, posterior face distinctly convex; dorsum armed with pair of broad-based dorsal teeth and pair of longer, acute lateral spines. Subpetiolar process widely rounded posteriorly. Anterior face of first gastral segment very weakly concave, narrowly rounding onto dorsum of segment.

Mandibles finely, mostly longitudinally rugose with numerous piliferous pits. Head, mesosoma, petiole and gaster finely shagreened, rather polished. Sculpturation only marginally increasing in density laterally with sides of pronotum, meso- and metapleurae and petiole weakly reticulate. Numerous shallow punctures and piliferous pits scattered over all dorsal surfaces.

Mandibles with numerous curved and semierect, short hairs on masticatory borders and outer margins. Anterior clypeal margin fringed with a few, anteriorly directed, relatively short setae, distinctly reducing in length laterally. Somewhat longer, paired hairs arising near anterior and basal clypeal margins and along frontal carinae. A few very short, bristle-like hairs lining apices of antennal scapes; a few isolated, medium length hairs on anterior face of fore coxae. Apex of gaster with medium length, erect hairs along posterior margins of segments.

Colour. Black; mandibular teeth, condylae and extreme tip of apical funicular segments reddish-brown. Legs, including coxae of mid- and hind legs, rather dark reddish-brown, fore coxae, bases of trochanters, proximal ends of tibiae and tarsi black.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis sulang* is known only from the type locality. Nothing is known about its nesting habits, but both specimens were collected by fogging and it is reasonable to suggest that they build their nests high in the

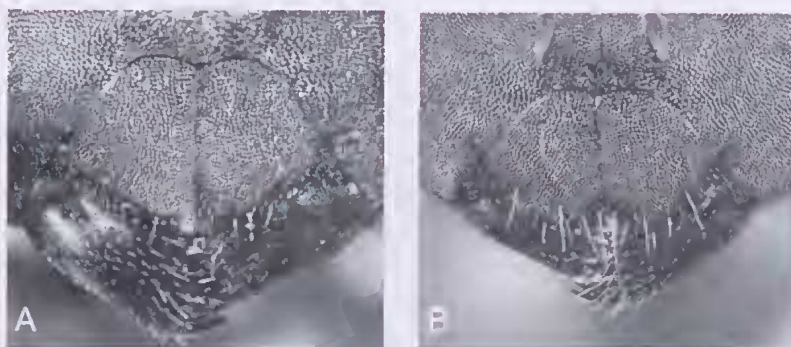


FIG. 5. *Polyrhachis* (*Cyrtomyrma*) species from Borneo. Frontal view of elypeus. A, *P. achterbergi* sp. nov.; B, *P. widodoi* sp. nov.

rainforest canopy. *Polyrhachis sulaug* closely resembles *P. laevisissima* Fr. Smith and *P. gibba* Emery from Sulawesi but differs from both by the distinctly lower and more evenly rounded outline of its mesosoma. It also differs from *P. laevisissima* by the configuration of the petiolar spines. In *P. laevisissima* they are reduced to obtuse teeth, while in *P. sulaug* the lateral petiolar spines are distinctly elongate. From *P. gibba* it differs by its considerably smaller size (HL 1.43-1.50 in *P. sulaug* versus 1.68-1.78 in *P. gibba*) and by the sculpturation of the body which, in *P. gibba* is rather coarse, notably on the head and sides of the mesosoma. The sculpturation in *P. sulaug* is much finer, with the head and mesosoma only superficially sculptured and highly polished. The legs, including the coxae, are distinctly light to medium red in *P. laevisissima*, reddish-brown with black coxae in *P. sulaug* and all virtually black in *P. gibba*.

***Polyrhachis widodoi* sp. nov.**
(Fig. 5B)

MATERIAL. HOLOTYPE: EAST MALAYSIA, SABAH, Gunung Rara, Tawau, 200-300m, 27.ii.1996, primary rf., canopy fogging, Erwin Widodo (worker). **PARATYPE:** Danum Valley Conserv. Area, Segama River trail, 04°57'N, 117°48'E, c. 150m, 11.xi.2000, rf., R.J. Kohout acc. 2000.217 (worker). Type distribution: Holotype in ITBC; paratype in QM.

DESCRIPTION. Worker. Dimensions (holotype cited first): TL c. 6.85, 7.11; HL 1.93, 2.00; HW 2.12, 2.03; CI 110, 101; SL 1.87, 1.96; SI 88, 96; PW 1.50, 1.47; MTL 2.37, 2.43 (2 measured).

Head broad, distinctly wider than long. Anterior clypeal margin with rather deep, open 'V' shaped emargination, laterally flanked by distinct teeth. Clypeus in profile virtually straight medially, smoothly curving posteriorly into

shallow basal margin; flat median line, clearly interrupting clypeal sculpturation, running posteriorly from centre of emargination to base of weakly impressed frontal triangle. Frontal carinae short with very weakly raised margins; central area with distinct, rather shallow frontal furrow. Sides of head almost straight in front of eyes; behind eyes widely rounding into weakly medially concave

occipital margin. Lateral carina separating gena from ventral parts of head absent. Eyes rather flat, situated well forward and inward from occipital corners; in full face eyes not reaching lateral cephalic outline. Ocelli indistinct in holotype, in paratype relative positions indicated by indistinct, shallow punctures in sculpture. Mesosoma in lateral view similar to that in *P. achterbergi*, but distinctly lower and less strongly convex, more closely resembling that of *P. bruehli*. In dorsal view pronotal humeri less massive than in *P. achterbergi* with pronotum narrower and spines somewhat more slender and acute. Promesonotal suture distinct, metanotal groove weakly indicated by shallow depression. Petiole armed with four spines; lateral spines longer than dorsal pair, but distinctly shorter than those in *P. achterbergi*.

Sculpturation of head, mesosoma and gaster consisting of uniform reticulate puncturation, identical to that in *P. achterbergi* and *P. bruehli*. Gaster very finely shagreened.

Pilosity, pubescence and colour as in *P. achterbergi*.

REMARKS. *Polyrhachis widodoi* is very similar to *P. achterbergi* with many characters virtually identical in both species. However, *P. widodoi* differs in several features, including the shape of the anterior clypeal margin. The margin in *P. widodoi* is deeply and widely emarginate medially with the emargination laterally flanked by distinct teeth (Fig. 5B). In contrast the anterior clypeal margin in *P. achterbergi* has a central, anteriorly projecting, blunt tooth (Fig. 5A). Additionally, the mesosoma in *P. widodoi* is distinctly flatter in lateral view and the lateral petiolar spines shorter than those in *P. achterbergi*.

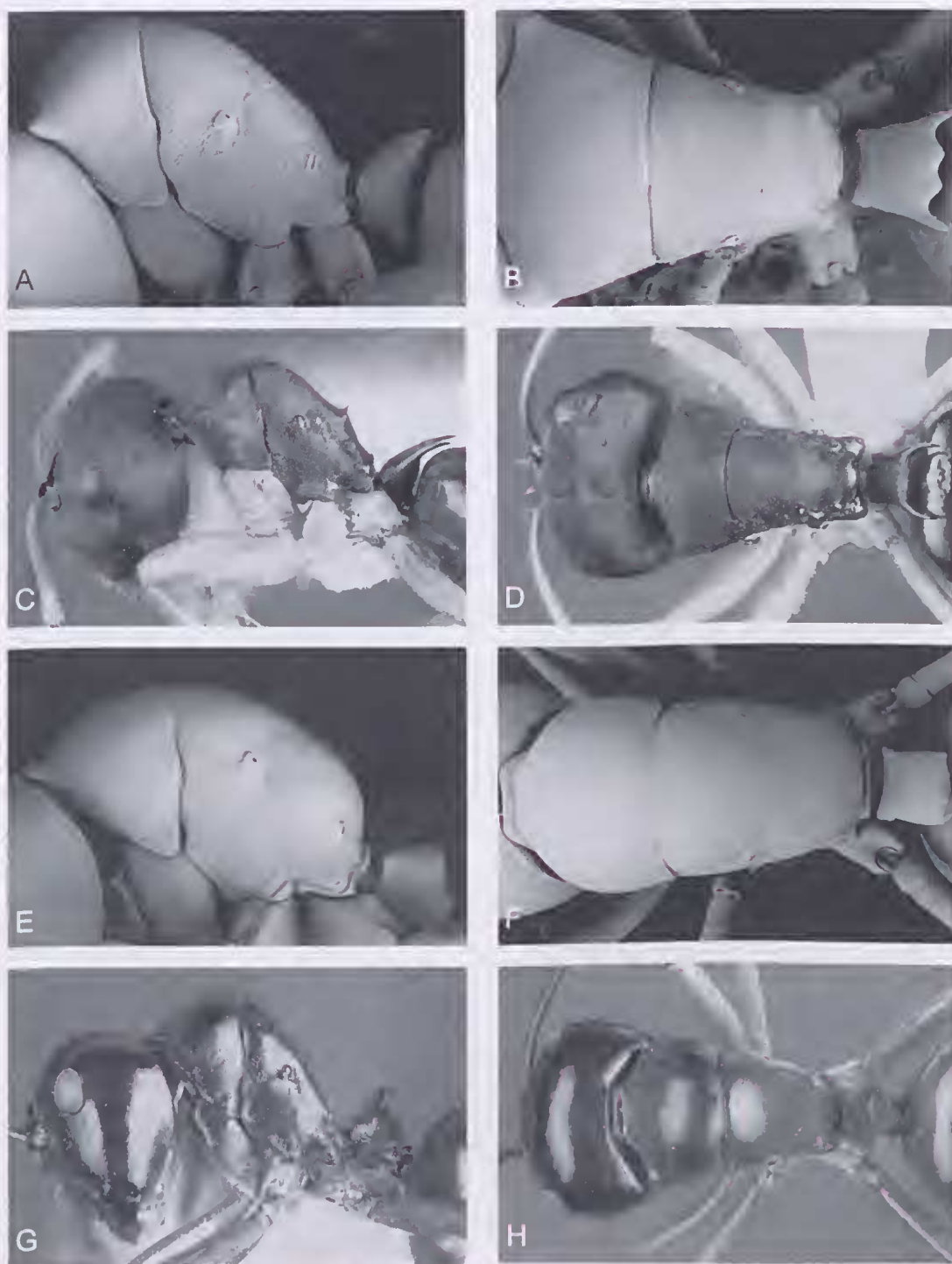


FIG. 6. *Polyrhachis* (*Cyrtomyrma*) species from Borneo, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. achterbergi* sp. nov.; C-D, *P. bruehli* sp. nov.; E-F, *P. danum* sp. nov.; G-H, *P. laevisissima* Fr. Smith.

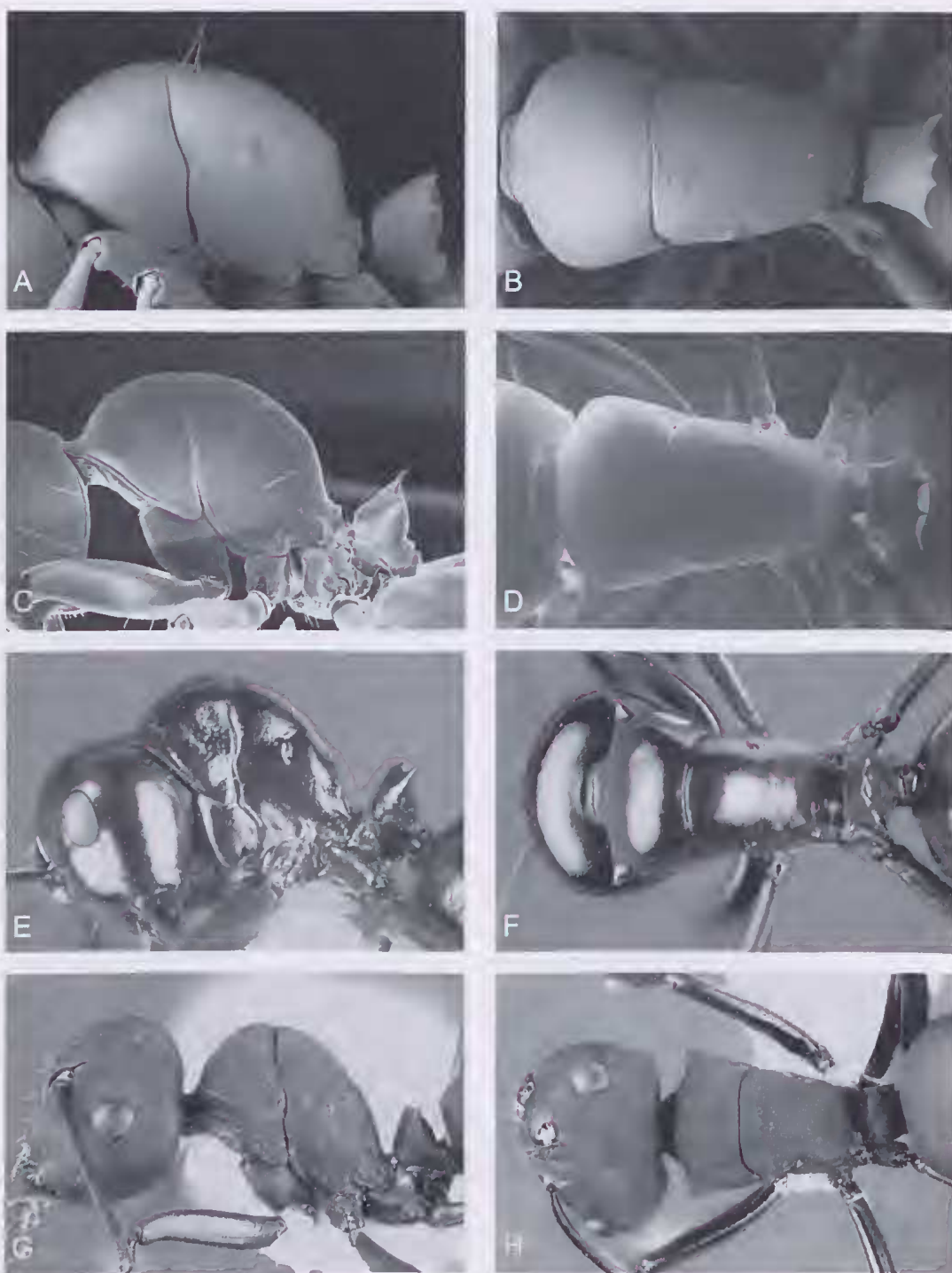


FIG. 7. *Polyrhachis* (*Cyrtomyrma*) species, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. lepida* sp. nov.; C-D, *P. rastellata* (Latreille); E-F, *P. sulang* sp. nov.; G-H, *P. vitalisi* Fr. Smith.

CHECKLIST OF *CYRTOMYRMA*
SPECIES FROM NEW GUINEA

The following list includes all *Cyrtomyrma* species known to occur in New Guinea, the Bismarck Archipelago and on neighbouring islands. *Polyrhaehis brevinoda* and *P. decumbens* mainly occur in Australia but their distributions just extend into New Guinea. They are treated with the Australian species. It also includes *P. rastellata* (in parentheses in the list and key) that has been previously reported from New Guinea. However its occurrence there is unconfirmed and unlikely (see discussion under the Bornean species). Synonyms are indented with extralimital junior synonyms excluded.

- P. albertisi* Emery
- P. aporema* sp. nov.
- P. barryi* sp. nov.
- P. brevinoda* sp. nov.
- P. conspicua* sp. nov.
- P. debilis* Emery
- P. decumbens* sp. nov.
- P. dorsena* sp. nov.
- P. euryala* Fr. Smith
- P. rastellata torricelliana* Viehmeyer
- P. lybosa* sp. nov.
- P. indueta* sp. nov.
- P. inflata* sp. nov.
- P. integra* sp. nov.
- P. kyawthani* sp. nov.
- P. leonidas* Forel
- P. liniae* Donisthorpe
- P. luetuosa* Emery
- P. mondoi* Donisthorpe
- P. nomo* Donisthorpe
- P. ralumensis* Forel
- P. rastellata major* Stitz
- (*P. rastellata* (Latreille))
- P. sedlaceki* sp. nov.
- P. strumosa* sp. nov.
- P. tuberosa* sp. nov.
- P. wagneri* Viehmeyer

The following key represents only a rough guide to the New Guinean *Cyrtomyrma* species. Besides the newly described species, it includes all the clearly taxonomically defined New Guinean taxa, as well as three closely related species occurring on neighbouring Indonesian islands. These three species (*P. aruensis* and *P. levior* from the Aru Islands and *P. goramensis* from Seram) are

discussed with the New Guinean species below for comparison. The key excludes some subspecific taxa of unresolved status and a taxonomically difficult group of species treated collectively and identified as '*rastellata*' by several authors. New Guinea has undoubtedly the most diverse *Cyrtomyrma* fauna and many more new species are likely to occur there. A taxonomic revision of the New Guinean *Cyrtomyrma* is presently under consideration, however, more detailed study of the material available, notably that in the collections of the Museum of Comparative Zoology, Cambridge and Bernice P. Bishop Museum, Honolulu, would be necessary before it could be successfully attempted.

KEY TO *CYRTOMYRMA* SPECIES
FROM NEW GUINEA
(BASED ON WORKER CASTE)

1. Pronotal humeri in dorsal view toothed, obtusely angular, or narrowly rounded; greatest width of pronotal dorsum across, or just behind shoulders (e.g. Figs 7D, 11F) ... 2
 - Pronotal humeri in dorsal view widely rounded; greatest width of pronotal dorsum at about mid-length of segment (e.g. Figs 8H, 9D) 10
2. Propodeum armed with a pair of more-or-less distinct spines (Fig. 8C) 3
 - Propodeum totally unarmed (Figs 7C, 11E) 7
3. Pronotal humeri bilobed or produced into prominent teeth 4
 - Pronotal shoulders angular or narrowly rounded 5
4. Propodeal spines long, dorso-ventrally compressed, widely diverging and bluntly terminated (Aru Is) . . . *levior* Roger
 - Propodeal spines very short, upturned and acute *albertisi* Emery
5. Propodeal spines long, dorsoventrally compressed, widely diverging and bluntly terminated; lateral petiolar spines distinctly longer than dorsal pair (Fig. 8C-D) *barryi* sp. nov. (in part)
 - Propodeal spines short, acute, strongly upturned 6
6. Larger species (HL > 1.68) *liniae* Donisthorpe
 - Smaller species (HL 1.56) *mondoi* Donisthorpe
7. Pronotal shoulders produced into prominent teeth (Aru Is) *aruensis* Viehmeyer
 - Pronotal shoulders angular or narrowly rounded (Figs 7D, 11F) 8.
8. Larger species (HL 2.09); head very broad with eyes rather flat, in full face view not reaching lateral cephalic outline (Bismarck Archipelago) *ralumensis* Forel
 - Smaller species (HL < 1.76); eyes convex, in full face view clearly extending beyond lateral cephalic outline 9

9. Pronotal dorsum with anterior face distinctly convex in profile (Fig. 7C); propodeal declivity oblique; legs orange or light red *rastellata* (Latreille)
- Pronotal dorsum with anterior face almost straight in profile (Fig. 11E); propodeal declivity virtually vertical; legs very dark reddish-brown *strumosa* sp. nov.
10. Propodeum armed with a pair of more-or-less distinct spines or tubercles (Figs 8C, 9A, 9E, 10A) 11
- Propodeum totally unarmed (eg. Figs 9G, 10C, 10G, 11A) 17
11. Pronotal dorsum in profile elevated, distinctly convex (Figs 9A, 10A) 12
- Pronotal dorsum only weakly convex or flat (Figs 8C, 9E) 13
12. Lateral petiolar spines distinctly elongated; summit of pronotal dorsum only marginally higher than dorsum of mesonotum (Fig. 9A) (Seram I.) ... *goramensis* Emery
- Lateral petiolar spines very short, rudimentary; summit of pronotal dorsum distinctly higher than dorsum of mesonotum (Fig. 10A) *integra* sp. nov.
13. Larger species (HL > 1.55) 14
- Smaller species (HL < 1.50) 16
14. Propodeal spines well developed, dorso-ventrally compressed (Fig. 8C); pronotal humeri rounded, weakly subangular (Fig. 8D) 15
- Propodeal spines rudimentary or present only as distinct tuberculae; pronotal humeri evenly rounded; petiole strongly transverse with dorsal spines reduced to minute denticles, lateral spines slender, widely diverging *wagneri* Viehmeyer
15. Petiole with spines more-or-less subequal; propodeal spines short, strongly upturned (Bismarck Archipelago) *leonidas* Forel
- Petiole with lateral spines distinctly longer than dorsal spines; propodeal spines long, only weakly upturned (Fig. 8C-D) *barryi* sp. nov. (in part)
16. Body covered with abundant appressed and decumbent hair; propodeal spines short, upturned; lateral petiolar spines long, slender (Fig. 9E-F) *inducta* sp. nov.
- Body with only sparse appressed hair; propodeal spines very short or present as mere denticles or tuberculae; petiolar spines subequal *debilis* Emery
17. Petiole virtually parallel-sided; petiolar spines very short, rudimentary (Fig. 1G) *brevinoda* sp. nov.
- Petiole with sides dorsally diverging; petiolar spines of various configurations, well developed (e.g. Figs 8B, 10H) 18
18. Head, mesosoma and petiole distinctly, closely reticulate-punctate, opaque (Figs 9G, 10E) 19
- Head, mesosoma, petiole and gaster very finely shagreened, rather smooth (eg Figs 8E, 11A) 20
19. Pronotal dorsum distinctly swollen, exceptionally high (Fig. 9G), with medially impressed longitudinal furrow along summit (Fig. 9H) *inflata* sp. nov.
- Pronotal dorsum not distinctly swollen (Fig. 10E), without longitudinal furrow on summit (Fig. 10F) *luctuosa* Emery
20. Petiole with pair of long, slender, outward- and backward-directed lateral spines, dorsal pair reduced to minute denticles (Fig. 11B); body surfaces smooth and highly polished (Fig. 11A) *sedlaceki* sp. nov.
- Petiole with lateral spines only marginally longer than dorsal pair or all spines subequal in length (eg. Figs 10D, 11H) 20
21. Body with numerous appressed and decumbent hairs (Fig. 10G) *nomo* Donisthorpe
- Body with only very sparse, short appressed hairs . 22
22. Larger species (HL > 1.47); lateral petiolar spines distinctly longer than dorsal pair; boy pubescence rather diluted (Fig. 10G, H) (New Guinea). *nomo* Donisthorpe
- Smaller species (HL < 1.40); petiolar spines subequal; body pubescence abundant (Figs 11H, I) (Australia, Papua) *decumbens* sp. nov.
23. Mesosomal dorsum in profile with evenly convex outline *euryala* Fr. Smith
- Mesosomal dorsum in profile with distinctly uneven outline (eg. Figs 8A, 8E, 8G, 11G) 24
24. Propodeal declivity oblique (Figs 8E, 8G, 11G) ... 25
- Propodeal declivity virtually vertical (Figs 8A, 9C, 10C) 27
25. Pronotal dorsum exceptionally high (Fig. 8E), with short, medially impressed longitudinal furrow (Fig. 8F) *conspicua* sp. nov.
- Pronotal dorsum not exceptionally high (Figs 8G, 11G), longitudinal furrow lacking (Figs 8H, 11H) 26
26. Anterior face of pronotal dorsum ascending towards rather short summit in very weakly convex, almost straight line (Fig. 11G) *tuberosa* sp. nov.
- Anterior face of pronotal dorsum ascending in strongly convex line towards distinctly swollen dorsum; pronotal-mesonotal summit relatively long (Fig. 8G) *dorsena* sp. nov.
27. Mesosoma in outline with pronotal dorsum strongly convex, rather swollen; propodeum relatively low (Fig. 9C) *lybosa* sp. nov.
- Mesosoma in outline with only weakly convex, rather low pronotal dorsum and distinctly high propodeum (Figs 8A, 10C) (Bismarck Archipelago) 28
28. Eyes distinctly convex, clearly breaching lateral cephalic outline in full face view; propodeal declivity lower, weakly concave at base; petiole with anterior face almost straight and posterior face convex (Fig. 8A) ... *aporema* sp. nov.
- Eyes rather flat, situated well inside cephalic outline in full face view; propodeal declivity higher, virtually vertical; petiole distinctly biconvex (Fig. 10C) *kyawthami* sp. nov.

***Polyrhachis albertisi* Emery, 1887**

Polyrhachis albertisi Emery, 1887: 240. Syntype workers, queen. Type locality: NEW GUINEA, Sorong (L.M. D'Albertis), MCSN (examined).

Polyrhachis (*Cyrtomyrma*) *albertisi* Emery, 1925: 207; Donisthorpe, 1938: 250.

REMARKS. *Polyrhachis albertisi* is apparently a rare species endemic to New Guinea and the syntypes are the only specimens available. It is characterised by distinctly toothed or bilobed pronotal humeri and closely resembles *P. levior*, with the mesosomal structure similar in both species. However, the humeral prominences are nearly equal in *P. levior*, while in *P. albertisi* the anterior lobe forms a blunt, but distinct tooth (similar to that in *P. aruensis* Viehmeier) and the posterior lobe is only weakly defined. The propodeal spines in *P. albertisi* are short and strongly upturned, while in *P. levior* they are longer, more massive and somewhat dorso-ventrally compressed.

***Polyrhachis aporema* sp. nov.**
(Fig. 8A-B)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, East New Britain Prov., Gazelle Pen., Baining Mts, 3km N of Malasait, 04°26'S, 151°53'E, c. 600m, 11.vii.1984, R.J. Kohout acc. 84.23 (worker). PARATYPES: data (and nest) as for holotype (19 workers, alate ♀, 3 ♂♂). Type deposition: Holotype, 5 paratype workers, paratype ♀ and paratype ♂♂ in ANIC; 2 paratype workers each in BMNH, MCZC, BPBM and QM. OTHER MATERIAL: PAPUA NEW GUINEA, East New Britain Prov., Gazelle Pen., Warongoi Valley, 100m, 25.v.1956 (JLG) (w).

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 6.60, 6.35-7.15; HL 1.62, 1.56-1.68; HW 1.56, 1.45-1.59; CI 96, 93-98; SL 2.25, 2.12-2.25; SI 144, 138-146; PW 1.28, 1.18-1.33; MTL 2.71, 2.56-2.74 (11 measured).

Clypeus in profile weakly convex, posteriorly rounding into weakly impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with weakly raised margins; central area weakly convex with frontal furrow distinct for most of its length. Sides of head in front of eyes weakly convex, converging towards mandibular bases; behind eyes sides rounding into broadly convex occipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Ocelli lacking, relative positions indicated by shallow punctures in cephalic sculpture. Pronotum in dorsal view with sides widely rounded, humeri indicated by weak angles in some specimens. Mesosoma in lateral view with pronotum very weakly convex, almost flat; promesonotal suture distinct, rather flat in outline; mesonotal dorsum weakly convex; metanotal groove indicated by very shallow impression; propodeal dorsum widely rounding into rather low, vertical declivity, weakly concave at base. Petiole in profile with anterior face

straight, posterior face convex; dorsum armed with four, acute, subequal teeth, tips of dorsal pair distinctly bent backwards. Subpetiolar process acute anteriorly, widely rounded posteriorly. Anterior face of first gastral segment marginally lower than apices of dorsal petiolar spines.

Mandibles finely rugose with sculpture reducing in intensity towards bases; numerous piliferous pits in loose longitudinal rows. Head, mesosoma and gaster finely shagreened dorsally, intensity of sculpturation increasing laterally, becoming reticulate; meso- and metapleurae reticulate-rugose. Petiole finely reticulate dorsally; distinctly reticulate-rugose at base. Shallow punctures and piliferous pits scattered in various densities over most body surfaces, rather diluted along summit of mesosomal dorsum.

Mandibles with medium length, curved hairs fringing masticatory borders. Anterior clypeal margin with usually one or two long, anteriorly directed setae medially and several shorter setae laterally. Paired, medium length, erect or semierect hairs near anterior and basal clypeal margins and fringing frontal carinae; single pair of hairs on vertex; single pair of long hairs on summit of mesonotum. Pair of relatively long, erect hairs on anterior face of front coxae and several shorter, erect hairs ventrally on trochanters and femora. Gaster with numerous, erect, relatively long hairs lining posterior margins of segments with hairs on ventral surfaces more abundant.

Colour. Black, mandibular teeth, condylae, distal ends of antennal scapes, tip of apical funicular segments and legs medium reddish-brown. Funiculi, proximal ends of tibiae and tarsi dark brown.

Queen. Dimensions: TL c. 7.41; HL 1.68; HW 1.53; CI 91; SL 2.21; SI 144; PW 1.62; MTL 2.74 (1 measured). Apart from sexual characters, very similar to worker except: pronotal humeri widely rounded; mesoscutum wider than long with lateral margins converging anteriorly, forming widely rounded anterior margin; median line bifurcate posteriorly; parapsides rather flat, slightly raised posteriorly; mesoscutum in profile widely rounded anteriorly, dorsum very weakly convex. Mesoscutellum convex, marginally elevated above plane of mesosoma; metanotal groove distinct. Propodeal dorsum rather flat before descending into very steep, almost vertical declivity; pair of distinct, subacute, propodeal tuberculae. Other characters, including sporadic pilosity and fine sculpturation, as in worker.

Males and immature stages (eggs, larvae and pupae) present in ANIC spirit collection.

REMARKS. *Polyrhachis aporema* is apparently restricted to the island of New Britain. The type colony consisted of a silk nest between leaves on a low tree in rainforest. *Polyrhachis aporema* is very similar to *P. kyawthani*, described below, with which it shares a similar mesosomal profile with a widely rounded propodeum and very steep declivity. However, *P. aporema* differs from *P. kyawthani* in the distinctly convex eyes that clearly break the lateral cephalic outline in full face view. The eyes in *P. kyawthani* are rather flat and situated well inside the cephalic outline. Although similar, the propodeal declivity in *P. aporema* is distinctly lower and weakly concave at the base, while in *P. kyawthani* the declivity is higher and virtually vertical. The petiole in *P. aporema* features a straight anterior face and convex posterior face, while the petiole in *P. kyawthani* is lower and distinctly biconvex.

Polyrhachis aruensis

Viehmeyer, 1912 stat. nov.

Polyrhachis laevisissima var. *aruensis* Viehmeyer, 1912: 9. Syntype workers. Type locality: INDONESIA, Aru Is., Wammar, Dobo (C. Ribbe), MNHU (examined). *Polyrhachis (Cyrtomyrma) laevisissima* var. *aruensis* Viehmeyer, Emery, 1925: 207; Donisthorpe, 1938: 253.

REMARKS. *Polyrhachis aruensis* differs from *P. laevisissima* in having the mesosomal dorsum evenly convex in profile. The petiolar spines are very distinct, slender and acute and the subpetiolar process bluntly angular posteriorly. In contrast the profile of the mesosomal dorsum in *P. laevisissima* (Fig 6G-H) features a rather convex pronotum, with the mesonotum, propodeum and declivity descending posteriorly in a very weakly bowed line. The petiolar spines are rather short and blunt and the subpetiolar process is very weakly rounded posteriorly. *Polyrhachis aruensis* is apparently a rare species, endemic to the Indonesian Aru Islands. Specimens collected by W. Karawajew (Wokan and Wammar Is) are the only material of the species known, apart from the syntypes.

***Polyrhachis barryi* sp. nov.**

(Fig. 8C-D)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Huon Pen., Mongi Watershed, Gemeheng, 1300m, 11-13.iv.1955, E.O. Wilson #788 (worker). PARATYPES: data as for holotype (2 workers); ditto, Mongi Watershed, Tumnang, 1500m, 14-15.iv.1955, E.O. Wilson #805 (3 workers). Type deposition: Holotype and 2 paratype workers in MCZC;

paratype worker each in ANIC, BMNH and QM. OTHER MATERIAL: PAPUA NEW GUINEA, Eastern Highlands Prov., Kassam, 48km E of Kainantu, 1350m, 28.x.1959, T.C. Maa (worker); Morobe Prov., Bulolo, 3000-4000ft, 21.xii.1970, B.B. Lowery (w, ♀).

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 6.25, 5.80-6.25; HL 1.62, 1.55-1.62; HW 1.53, 1.37-1.53; CI 94, 89-96; SL 2.06, 1.81-2.06; SI 135, 125-135; PW 1.31, 1.18-1.31; MTL 2.43, 2.18-2.43 (6 measured).

Clypeus in profile straight anteriorly, posteriorly rounding into medially impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with weakly raised margins; central area weakly concave with indistinct frontal furrow. Sides of head in front of eyes moderately convex, converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, rather large and prominent, in full face view clearly breaking lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri rounded or very weakly angular; greatest width of pronotal dorsum behind shoulders or towards mid-length of segment in some specimens. Mesosoma in profile relatively low, convex anteriorly, weakly sinuate posteriorly; promesonotal suture distinct; mesonotal dorsum weakly convex; metanotal groove lacking; propodeum armed with relatively long, blunt, widely diverging and distinctly dorso-ventrally compressed spines; posterior margins of spines continued medially, forming wide 'U' but failing to meet, leaving a small gap through which propodeal dorsum meets rather steep declivity. Petiole with anterior face straight, posterior face weakly convex; dorsum armed with four spines; dorsal pair short, broad-based with tips slightly bent backwards; lateral pair slender, more than twice as long as dorsal pair. Subpetiolar process acutely angular anteriorly, narrowly rounded posteriorly. Anterior face of first gastral segment flat, rounding in even curve onto dorsum of segment.

Mandibles very finely, mostly longitudinally rugose with numerous shallow pits. Head, mesosoma and gaster shagreened with sides of pronotum, meso- and metapleurae and lower portions of petiole distinctly reticulate to reticulate-rugose. Shallow, mostly piliferous punctures rather densely distributed over all body surfaces.

A few semierect hairs at mandibular masticatory borders. Anterior clypeal margin lined with relatively short, anteriorly directed setae. Several

paired, medium length, erect hairs near anterior and basal clypeal margins and along frontal carinae. A few rather long, erect hairs on anterior face of fore coxae; medium length, erect hairs on anterior face of subpetiolar process and around apical gastral segments. Numerous very short, appressed hairs arising from punctures over most body surfaces.

Colour. Black; including most of antennal scapes, coxae and tarsi. Mandibular masticatory borders, condylae and extreme tip of apical funicular segments light to medium reddish-brown. Legs varying from light reddish-brown, with proximal ends of tibiae narrowly darker, to very dark brown.

Queen. Dimensions: TL c. 7.46; HL 1.78; HW 1.68; CI 94; SL 2.18; SI 130; PW 1.75; MTL 2.87 (1 measured). Apart from sexual characters, very similar to worker except: pronotal humeri more rounded, mesoscutum slightly transverse, with evenly rounded anterior margin; median line short, not reaching dorsum of segment; parapsides rather flat, slightly elevated posteriorly; dorsum of mesoscutum in profile flat posteriorly, widely rounded anteriorly. Mesoscutellum convex, elevated above dorsal plane of mesosoma. Metanotal groove distinct. Propodeal dorsum weakly convex, abruptly rounding into vertical declivity; propodeal spines slightly shorter than in worker. Petiole with pair of short, very broad-based dorsal teeth and pair of more slender, distinctly longer lateral spines. Other characters, including sculpturation and virtual lack of dorsal pubescence as in worker.

Males and immature stages unknown.

REMARKS. *Polyrhachis barryi* is apparently restricted to higher elevations in Papua New Guinea. Nothing is known about its nesting habits, but a tag on specimens collected by B.B. Lowery states they were collected 'under bark and on foliage of Hoop pine in plantation'. *Polyrhachis barryi* is relatively similar to *P. leonidas* Forel from the Bismarck Archipelago from which it can be distinguished by its distinctly finer body sculpturation, a more convex pronotal dorsum and distinctly longer propodeal and lateral petiolar spines. *Polyrhachis leonidas* has short to very short, strongly upturned, almost vertical propodeal spines and petiolar spines that are subequal in length. The eyes also differ with those of *P. leonidas* being more convex and prominent, clearly breaking lateral cephalic outline in full face view.

***Polyrhachis conspicua* sp. nov.**
(Fig. 8E-F)

MATERIAL. HOLOTYPE: INDONESIA, WEST IRIAN, Waris, S of Hollandia (= Sukarnaputra), 03°30'S, 140°55'E, 450-500m, 24-31.viii.1959, T.C. Maa (worker). PARATYPES: data as for holotype (1 worker); INDONESIA, WEST IRIAN, Nabire, S of Geelving Bay, 03°22'S, 135°29'E, 1-20m, 3.vii.1962, J.L. Gressitt & J. Sedláček (worker); INDONESIA, Schouten Is, SE Biak I., 01°00'S, 136°00'E, 1.vii.1962, J.L. Gressitt & J. Sedláček (2 workers). PAPUA NEW GUINEA, West Sepik Prov., Pes Mission, c.12km WSW of Aitape, 03°11'S, 142°15'E, <50m, 31.vii-3.viii.1984, RJK acc.84.160 (worker); Madang Prov., 40km W of Madang, 05°13'S, 145°25'E, 140m, 1.ii.1989, P.S. Ward #10113-24 (2 workers). Type deposition: Holotype in MCZC, 1 paratype each in ANIC, BMNH, BPBM, QM.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 6.00, 5.49-6.65; HL 1.59, 1.47-1.69; HW 1.53, 1.43-1.57; CI 96, 93-99; SL 1.90, 1.72-2.06; SI 124, 120-131; PW 1.15, 1.06-1.31; MTL 2.28, 1.93-2.34 (6 measured).

Clypeus in profile very weakly convex or almost straight in some specimens, narrowly rounding posteriorly into weakly medially impressed basal margin. Frontal triangle weakly impressed. Frontal carinae sinuate with very weakly raised margins; central area rather flat with frontal furrow weakly indicated for most of its length. Sides of head in front of eyes only weakly convex, almost straight, strongly converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes moderately convex, clearly breaking lateral cephalic outline in full face view. Ocelli lacking, relative positions indicated by shallow punctures in sculpturation. Pronotum in dorsal view with humeri rounded. Mesosoma in profile with pronotum very strongly convex, very high, anterior face vertical; summit narrow with short, median, longitudinal furrow; promesonotal suture moderately impressed; mesonotal dorsum weakly convex; metanotal groove lacking, its position indicated by depression in mesosomal outline; propodeal dorsum descending in shallow curve into oblique declivity. Petiole with anterior face straight, posterior face convex; dorsum armed with four, acute, subequal spines; dorsal pair situated closer to each other than to lateral spines, tips slightly bent backwards. Subpetiolar process acute anteriorly, bluntly angular posteriorly. Anterior face of first gastral segment marginally lower than apices of dorsal petiolar spines.

Mandibles very finely, mostly longitudinally rugose. Head, mesosoma and gaster finely

shagreened, rather polished; pronotal sculpturation becoming laterally reticulate; lower sides of mesosoma, notably meso- and metapleurae rather strongly reticulate-rugose. Petiole with anterior face finely reticulate, sculpturation more distinct on sides. Dorsal surfaces of head, mesosoma and gaster with piliferous pits and shallow punctures of various densities.

Mandibles with a few, rather short, semierect hairs near masticatory borders. Anterior clypeal margin with 1 or 2 relatively long, erect, anteriorly directed setae medially and several shorter setae laterally. A few paired, rather short, erect hairs near anterior and basal clypeal margins, several hairs along frontal carinae and pair of distinctly longer hairs on vertex. Summit of mesosoma with tuft of erect, somewhat curved hairs, more than half of greatest diameter of eyes in length (number of hairs in some specimens reduced to one or two probably due to abrasion). Posterior margins of gastral segments with a few, medium length, erect hairs, more abundant on ventral surfaces and around gastral apex. Very short, mostly appressed or decumbent hairs in various densities arising from pits and punctures over all body surfaces.

Colour. Black with only mandibular masticatory borders, condylae, tips of apical funicular segments and joints between trochanters and femora, reddish brown. Tibiae towards their distal ends a shade lighter.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis conspicua* occurs in Irian Jaya, Papua New Guinea and the adjacent Biak Island. It has been collected only on a handful of occasions and nothing is known about its nesting habits. *Polyrhachis conspicua* is a spectacular species and is similar to *P. inflata* described below. Both share the exceptionally high, narrowly convex pronotum, which features a short, longitudinal furrow along its summit. However, they differ in size (HL 1.47-1.68 in *P. conspicua* versus 1.68-1.81 in *P. inflata*) and in general body sculpturation that is smooth and polished in *P. conspicua* and closely reticulate-punctate and opaque in *P. inflata*.

Polyrhachis debilis Emery, 1887

Polyrhachis laevior var. *debilis* Emery, 1887: 240. (Variant spelling.) Syntype workers. Original localities: NEW GUINEA, Fly River (L.M. D'Albertis); INDONESIA, Aru Is (O. Beccari), MCSN, MHNG, NMNH, QM (examined).

Polyrhachis levior var. *debilis* Emery, Dalla Torre, 1893: 264.

Polyrhachis (Cyrtomyrma) rastellata ssp. *laevior* var. *debilis* Emery, Emery, 1925: 208. (Variant spelling).

Polyrhachis (Cyrtomyrma) debilis Emery, Donisthorpe, 1938: 265. Description of queen. Raised to species.

REMARKS. *P. debilis* is relatively similar to *P. yorkana* from Australia, with their distinguishing characters provided under the latter. *P. debilis* occurs from Papua New Guinea to the islands of eastern Indonesia. Specimens of *P. debilis* previously recorded from Australia (Kohout, 2000) belong to *P. yorkana*. Although the type locality of *P. debilis* (Fly River, Papua New Guinea) is situated just across Torres Strait from Cape York Peninsula, it apparently does not occur in Australia.

Polyrhachis dorsena sp. nov.

(Fig. 8G-H)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, West Sepik Prov., Torricelli Mts, 1-2km NE of Lumi, 03°28'S, 142°02'E, 400-500m, 4-13.viii.1984. R.J. Kohout acc. 84.232 (worker). **PARATYPES:** data as for holotype (19 workers, 7 alate ♀). Type deposition: Holotype, most paratype workers and paratype ♀ in ANIC; 3 paratype workers and 1 paratype ♀ in BMNH, MCZC and QM; 1 paratype worker each in AMNH, BPBM, CASC and NMNH. **OTHER MATERIAL:** INDONESIA, WEST IRIAN, Wisselmeren, Urapura, Kamo Valley, 03°55'S, 136°15'E, 1530m, 15.viii.1955 (JLG) (w). PAPUA NEW GUINEA, East Sepik Prov., Maprik, 150m, 29.xii.1959-17.i.1960 (TCM) (w); Hayfield nr Maprik, c. 150m, 27-28.vi.1972 (RWT acc. 72.494) (w); Eastern Highlands Prov., Kassam, 49km E of Kainantu, 1350m, 30.x. & 7.xi.1959 (TCM) (w); Northern Prov., Managalase Area, 2500-3000ft, viii.1965 (R. Pullen) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 6.35, 5.80-6.35; HL 1.65, 1.50-1.65; HW 1.62, 1.40-1.62; CI 98, 93-98; SL 2.06, 1.78-2.06; SI 127, 124-131; PW 1.25, 1.12-1.25; MTL 2.40, 2.15-2.40 (6 measured).

Clypeus in profile very weakly convex, narrowly rounding posteriorly into weakly medially impressed basal margin. Frontal triangle very weakly impressed, indistinct. Frontal carinae sinuate with very weakly raised margins; central area rather flat with weak frontal furrow. Sides of head in front of eyes weakly convex, converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes weakly convex, in full face view not reaching lateral cephalic outline. Ocelli lacking, relative position of median ocellus indicated by shallow puncture in sculpture. Pronotum in dorsal view with humeri widely rounded; greatest width of pronotal dorsum at mid-length of segment. Mesosoma in profile with pronotum strongly

convex, its anterior face rising steeply, vertically in some specimens; promesonotal suture distinct; mesonotal dorsum almost flat, gently descending posteriorly; metanotal groove weakly indicated; propodeal dorsum and declivity forming single, uninterrupted curve in profile. Petiole with anterior face straight, posterior face convex; dorsum armed with four subequal spines; dorsal pair closer to each other than to lateral spines, tips slightly bent backwards. Subpetiolar process acute anteriorly, bluntly angular posteriorly. Anterior face of first gastral segment marginally lower than apices of dorsal petiolar spines.

Mandibles very finely longitudinally rugose with numerous piliferous pits towards bases. Head, mesosoma and gaster rather polished, finely shagreened with sculpturation distinctly more reticulate-rugose laterally, notably on meso- and metapleurae. Petiole with anterior face finely, mostly transversely reticulate with sculpture on posterior face distinctly finer and more polished; lower portions of petiole distinctly reticulate-rugose. All dorsal body surfaces with numerous piliferous pits and shallow punctures.

Mandibles with a few short, semierect hairs along masticatory borders. Anterior clypeal margin with a few anteriorly directed setae medially and several shorter setae laterally. A few pairs of erect hairs near anterior and basal clypeal margins and along frontal carinae. Tuft of medium length, somewhat curved hairs on summit of mesonotum, some almost as long as greatest diameter of eye. A few rather isolated hairs on anterior faces of fore coxae and ventral surfaces of fore femora. Numerous erect hairs along posterior margins of gastral segments, more abundant ventrally. Very short, appressed hairs arising from pits and shallow punctures over most body surfaces.

Colour. Black; mandibular masticatory borders, condylar, tips of apical funicular segments and joints between trochanters and femorae, reddish-brown. Antennae and legs medium reddish-brown; tarsi black. Anterior and ventral portions of gaster rather diffusely blotched with reddish-brown.

Queen. Dimensions: TL c. 8.06; HL 1.84; HW 1.68; CI 91; SL 2.15; SI 128; PW 1.84; MTL 2.72 (1 measured). Apart from sexual characters, very similar to worker except: pronotal humeri widely rounded, mesoscutum slightly transverse, with evenly rounded anterior margin; median line short; parapsides rather flat, slightly elevated posteriorly; mesoscutum in profile distinctly convex anteriorly, with flat dorsum. Mesoscutellum convex, well

elevated above dorsal plane of mesosoma. Metanotal groove distinct. Propodeal dorsum weakly convex, widely rounding into oblique declivity. Other characters, including sculpturation and pubescence as in worker.

Males unknown. Immature stages (larvae and pupa) in ANIC collection.

REMARKS. *Polyrhachis dorsena* is evidently restricted to New Guinea. The type colony was collected from a silk nest built on the underside of a palm leaf in rainforest. *Polyrhachis dorsena* is rather similar to *P. lybosa*, described below, with distinguishing characters listed under that species. It also resembles *P. conspicua*, however, *P. dorsena* has the pronotal dorsum less strongly convex and lacks a medial, longitudinal furrow along its summit.

Polyrhachis euryala Fr. Smith, 1863

Polyrhachis euryalus Fr. Smith, 1863: 17. Syntype workers. Type locality: INDONESIA, Misool I. (A.R. Wallace), OXUM, BMNH (examined).

Polyrhachis euryalus Fr. Smith, Mayr, 1872: 138. Junior synonym of *P. rastellata* (Latreille, 1802).

Polyrhachis rastellata var. *euryalus* Fr. Smith, Emery, 1900: 720. Revived from synonymy and variety of *P. rastellata* (Latreille, 1802).

Polyrhachis rastellata ssp. *euryala* var. *torricelliana* Viehmeyer, Viehmeyer, 1914: 50. Junior synonym of *P. rastellata euryala* Fr. Smith.

Polyrhachis (Cyrtomyrma) *rastellata* ssp. *euryalus* Fr. Smith, Emery, 1925: 208. Subspecies of *P. rastellata* (Latreille, 1802) and combination in *P. (Cyrtomyrma)*.

Polyrhachis (Cyrtomyrma) *euryalus* Fr. Smith, Donisthorpe, 1938: 259, fig 10. Reviewed status as species.

REMARKS. From the synonymic list above, it appears that various authors were uncertain as to the precise status of this species. Mayr (1862), Dalla Torre (1893) and Bingham (1903) all considered *P. euryala* to be a junior synonym of *P. rastellata*, while Emery listed it as a variety (1900) and later (1925) as a subspecies of *P. rastellata*. Donisthorpe (1938) reinstated *P. euryala* as a good species, redescribed it and noted that 'the pronotum is broadest in the middle' and that 'It is a smaller much more slender ant than *rastellata*'. Bolton (1995) and Dorow (1995) both listed *P. euryala* as a distinct species in their catalogues, and I am confident it is a valid species. As Donisthorpe noted, *P. euryala* is distinctly more slender than *P. rastellata* with the greatest width of the pronotal dorsum in the middle of its length. *Polyrhachis rastellata* is more robust, notably across the pronotum which is widest across, or just behind the shoulders. *Polyrhachis euryala* appears to be an uncommon species with a rather patchy distribution from the eastern islands of Indonesia

across New Guinea. Several specimens from Pes Mission (Papua New Guinea) compare well with the holotype of *P. euryala* from Mysol I. in spite of their slightly larger size (HL 1.53 in syntypes versus 1.56-1.68 in compared specimens) and colour of their appendages (reddish-brown in both syntypes versus very dark brown or black in the modern specimens).

***Polyrhachis goramensis* Emery, 1887**
(Fig. 9A-B)

Polyrhachis rastellata var. *goramensis* Emery, 1887: 239. Syntype workers. Type locality: INDONESIA, Goram I. (= Seram I.), (L.M. D'Albertis), MCSN (examined).

Polyrhachis (*Cyrtomyrma*) *rastellata* ssp. *euryalus* var. *goramensis* Emery. Emery, 1925: 208. Combination in *P. (Cyrtomyrma)*.

Polyrhachis (*Cyrtomyrma*) *euryalus* var. *goramensis* Emery. Donishorpe, 1938: 260.

Polyrhachis goramensis Emery. Kohout, 1998: 527. Raised to species.

REMARKS. *Polyrhachis goramensis* is characterised by: a distinctly swollen pronotal dorsum; a moderately impressed pro-mesonotal suture; short, acute propodeal spines that are sometimes reduced to a pair of tubercles, and distinctly elongated lateral petiolar spines. It is rather similar to *P. integra*, described below, with the main distinguishing characters given under that species. *Polyrhachis goramensis* appears to be endemic to Seram I.

***Polyrhachis hybosa* sp. nov.**
(Fig. 9C-D)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, Northern Prov., Kokoda, 1200ft, iv.1933 (L.E. Cheesman #350, B.M. 1933-577) (w) **PARATYPES:** data as for holotype (2 workers). Type deposition: Holotype in BMNH, 1 paratype worker each in MCZC and QM. **OTHER MATERIAL:** PAPUA NEW GUINEA, Northern Prov., Pongani R., Boikiki Plm, c. 8km NNE of Afore, c. 09°06'S, 148°25'E, c. 500m, 29-30.ix.1984 (RJK acc. 84.386) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 7.11, 6.85-7.11; HL 1.81, 1.72-1.81; HW 1.75, 1.65-1.78; CI 97, 96-98; SL 2.34, 2.28-2.34; SI 134, 131-138; PW 1.37, 1.31-1.40; MTL 2.90, 2.81-2.90 (3 measured).

Clypeus in profile virtually straight, rounding posteriorly into very shallow basal margin. Frontal triangle weakly impressed, rather indistinct. Frontal carinae sinuate with raised margins; central area medially concave with relatively short, weakly impressed frontal furrow. Sides of head in front of eyes convex, converging towards mandibular bases; behind eyes sides

widely rounding into broadly convex occipital margin. Eyes weakly convex, almost flat, situated well inwards from occipital corners; not reaching lateral cephalic outline in full face view. Ocelli lacking. Pronotum in dorsal view widely rounded; greatest pronotal width at mid-length of segment. Mesosoma in profile with pronotum strongly convex, distinctly swollen, anterior face rising steeply towards summit; promesonotal suture distinct, rather flat in profile; mesonotal dorsum weakly convex, gently descending posteriorly; metanotal groove faintly indicated; outline of propodeal dorsum flat, rounding into steep declivity in uninterrupted curve. Petiole in profile virtually triangular, with anterior and posterior faces straight; dorsum armed with four short, subequal teeth; dorsal pair distinctly closer to each other than to lateral spines, tips slightly bent backwards. Subpetiolar process acute anteriorly, rounded posteriorly. Anterior face of first gastral segment straight with anterodorsal margin lower than full height of petiole.

Mandibles finely, longitudinally rugose with numerous piliferous pits. Head, mesosoma and gaster finely shagreened, sculpturation marginally coarser on lower parts of mesosoma; meso- and metapleurae weakly reticulate-rugose. Dorsal half of petiole finely, transversely reticulate, sculpturation distinctly coarser around base. Numerous shallow punctures and piliferous pits scattered over all body surfaces.

Mandibles with several rather short, semierect hairs on masticatory borders. Anterior clypeal margin with a few medium length, anteriorly directed setae medially and a few short setae laterally. A few pairs of medium length hairs near anterior and basal clypeal margins and along frontal carinae; single pair of erect hairs on vertex. A few longer, semierect hairs on posterior faces of fore coxae and along posterior margins of apical gastral segments, more abundant ventrally. Whole body with very short, appressed hairs arising from numerous pits.

Colour. Black; mandibular teeth, condylae and tips of apical funicular segments reddish-brown. Legs medium to dark reddish-brown with proximal ends of tibiae and tarsi black. Posterior margins of gastral segments somewhat diffusely reddish-brown.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis hybosa* is known only from the Northern Province of Papua New Guinea. Nothing is known about its nesting

habits with all specimens taken foraging on low vegetation. *Polyrhachis hybosa* is very similar to *P. dorsena*, described above, with both species featuring a distinctly swollen pronotal dorsum and widely rounded pronotal shoulders. However, the mesosoma in *P. hybosa* is distinctly more robust in comparison with that of *P. dorsena*. Also, the eyes in *P. hybosa* are rather flat and they do not reach the lateral cephalic outline in full face view. The eyes in *P. dorsena* are moderately convex and with the head in full face view, they marginally exceed the lateral outline.

***Polyrhachis inducta* sp. nov.**
(Fig. 9E-F)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Bulolo, 21.xii.1970, B.B. Lowery (worker). PARATYPES: data as for holotype (12 workers). Type distribution: Holotype and 2 paratypes in ANIC; 2 paratypes each in BMNH, MCZC, NMNH and QM.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 5.34, 5.09-5.95; HL 1.43, 1.34-1.50; HW 1.37, 1.25-1.43; CI 96, 93-98; SL 1.87, 1.72-1.90; SI 136, 127-140; PW 1.12, 1.00-1.18; MTL 2.12, 2.00-2.21 (13 measured)

Clypeus in profile straight, with indication of rather weak, median tubercle just before narrowly rounding into medially impressed basal margin. Frontal triangle very weakly impressed, indistinct. Frontal carinae sinuate with weakly raised margins; central area relatively narrow, weakly concave with short frontal furrow. Sides of head in front of eyes almost straight, converging towards mandibular bases; behind eyes sides widely rounding into convex occipital margin. Eyes convex, in full face view distinctly breaking lateral cephalic outline. Ocelli lacking; vertex with only shallow punctures indicating their relative positions. Pronotum in dorsal view widely rounded, greatest width of pronotal dorsum at mid-length of segment. Mesosoma in lateral view with pronotum only weakly convex, mesonotal and propodeal dorsa more highly convex; promesonotal suture distinct; metanotal groove lacking; propodeal dorsum armed with relatively short, acute, upturned spines; declivity virtually vertical. Petiole with anterior face straight, posterior face convex; dorsum armed with four spines; dorsal pair triangular; lateral pair more slender and distinctly longer. Subpetiolar process acute anteriorly, bluntly angular posteriorly. Anterior face of first gastral segment higher than apices of dorsal petiolar spines.

Mandibles finely rugose. Head, mesosoma and gaster shagreened; sculptural intensity markedly increasing laterally with sides of mesosoma and base of petiole distinctly reticulate-rugose; meso- and notably metapleurae deeply, irregularly, foveolate-rugose. Whole body covered with numerous piliferous pits and shallow punctures.

Mandibles with numerous semierect hairs along masticatory borders and very short appressed hairs towards bases. Anterior clypeal margin with a few medium length, anteriorly directed setae medially and several very short setae laterally. A few pairs of longer, erect hairs near anterior and basal clypeal margins and along frontal carinae; single pair of long hairs on vertex. Fore coxae with a few erect hairs. Posterior margins of gastral segments with numerous erect hairs. Whole body with dense, short, appressed and decumbent hairs, those on dorsum of mesosoma more erect than hairs on head and gaster.

Colour: Black; clypeus, sides of head and gaster diffusely reddish-brown. Antennal scapes very dark brown with distal ends and funiculi distinctly lighter. Mandibles, coxae and tarsi dark reddish-brown with mandibular masticatory borders, trochanters, femora and tibiae a shade lighter.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis inducta* is apparently restricted to New Guinea with the only known specimens collected from a nest under the bark of tree. It is rather similar to *P. nomo* and *P. decumbens* with which it shares the dense cover of appressed and decumbent hairs. It differs from both in the outline of the mesosoma that in *P. decumbens* and *P. nomo* is distinctly more convex anteriorly with the mesonotum and propodeum rather weakly rounding into an obliquely descending propodeal declivity. In *P. inducta* the outline of the pronotal dorsum is only weakly convex with the mesosomal and propodeal dorsa distinctly higher and curving abruptly into a vertical propodeal declivity. *Polyrhachis inducta* also differs by the presence of distinct propodeal spines that are virtually absent in *P. decumbens* and *P. nomo*.

***Polyrhachis inflata* sp. nov.**
(Fig. 9G-H)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, West Sepik Prov., Torricelli Mts, Lumi, 03°29'S, 142°02'E, x.1984, D. Waisi (worker). PARATYPES: data as for holotype (2 workers); ditto, 1-2km NE of Lumi, 400-500m, 11-13.viii.1984, rf, RJK acc. 84.283

(♀). Madang Prov., Adalbert Mts, Wanuma, 04°36'S, 145°06'E, viii.1968, N.L.H. Krauss (1 worker). Gulf Prov., Ivimka camp, Lakekamu Basin, 07.7°S, 146.8°E, 120m, 11-20.xi.1996, Malaise trap, R.R. Snelling (1 worker). Type deposition: Holotype worker (QMT99345) and paratype ♀ in QM; 1 paratype worker each in ANIC, BMNH, BPBM and MCZC.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 7.26, 6.50-7.26; HL 1.81, 1.68-1.84; HW 1.72, 1.62-1.81; CI 95, 94-98; SL 2.34, 2.09-2.34; SI 136, 128-136; PW 1.37, 1.28-1.40; MTL 2.78, 2.43-2.81 (5 measured).

Clypeus in profile almost straight, with weak median tubercle just before narrowly rounding into weakly medially impressed basal margin. Frontal triangle weakly impressed. Frontal carinae sinuate with weakly raised margins; central area almost flat with frontal furrow indicated along most of its length. Sides of head in front of eyes almost straight, strongly converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Ocelli lacking, shallow punctures indicating relative positions of lateral ocelli poorly visible under overlying sculpturation. Pronotum in dorsal view widely rounded; greatest width of pronotal dorsum at mid-length of segment. Mesosoma in profile with pronotum strongly convex, very high, anterior face very steep; summit narrow with short, median, longitudinal furrow; promesonotal suture distinct; mesonotal dorsum virtually straight except for depression indicating position of metanotal groove; propodeal dorsum descending in open, uninterrupted curve into oblique declivity. Petiole with anterior face straight, posterior face very weakly convex; dorsum armed with four subequal spines; dorsal pair closer to each other than to lateral spines, tips slightly bent backwards. Subpetiolar process acute anteriorly, rounded posteriorly. Anterior face of first gastral segment straight, rounding in even curve onto dorsum of segment.

Mandibles finely, longitudinally striate with numerous piliferous pits. Head, mesosoma and petiole very closely reticulate-punctate; sculpturation on sides of mesosoma more coarse, becoming reticulate-rugose on meso- and metapleurae. Petiole finely, mostly transversely reticulate, distinctly reticulate-rugose around base. Gaster rather strongly shagreened, sculpture generally less coarse than on head and mesosoma. All dorsal body surfaces with numerous piliferous pits and punctures.

Mandibles with numerous semierect hairs on masticatory borders. Anterior clypeal margin

with a few anteriorly directed setae medially and several shorter setae laterally. Paired, relatively long, erect hairs near anterior and basal clypeal margins and along frontal carinae; single longer pair on vertex. One or 2 long, erect hairs on anterior and posterior faces of fore coxae. Numerous, medium length, erect hairs lining posterior margins of gastral segments; ventral surfaces with hairs distinctly more abundant, posteriorly directed and with rather dense cover of decumbent hairs. Abundant, very short, appressed hairs arising from numerous pits over all dorsal body surfaces.

Colour. Black, with only mandibular teeth, condylae, extreme tips of apical funicular segments and narrow band on trochanters, medium reddish-brown.

Queen. Dimensions: TL c. 8.11; HL 1.93; HW 1.72; CI 89; SL 2.34; SI 136; PW 1.84; MTL 3.17 (1 measured). Apart from sexual characters, very closely resembling worker except: pronotal humeri widely rounded; mesoscutum in profile widely rounded anteriorly, dorsum rather flat; mesoscutum in dorsal view only marginally wider than long, lateral margins converging anteriorly into narrowly rounded anterior margin; median line clearly indicated, bifurcate posteriorly; parapsides rather flat, weakly raised posteriorly. Mesoscutellum in profile convex, higher than mesoscutum; metanotal groove distinct. Propodeal dorsum descending into oblique declivity in narrow curve. Sporadic pilosity and sculpturation as in worker, except mesothoracic epimera and episterna very finely reticulate without punctures or piliferous pits.

Male and immature stages unknown.

REMARKS. *Polyrhachis inflata* is evidently endemic to New Guinea. Nothing is known about its nesting habits with specimens of the type series collected in a rainforest clearing on trunks of recently felled trees. *Polyrhachis inflata* is probably related to *P. luctuosa* Emery, 1921 (Fig. 10G-H) with both distinguished from all other known New Guinean species of the subgenus by the very closely reticulate-punctate sculpturation of their body, giving them a distinct opaque appearance. However, *P. inflata* is easily separated by its exceptionally high pronotal dorsum which bears a well-defined, median, longitudinal furrow along its summit. The pronotum in *P. luctuosa* is not swollen and has no furrow. With its highly raised pronotum, *P. conspiciua* also resembles *P.*

inflata, but the body sculpturation in *P. conspicua* is rather smooth and polished.

***Polyrhachis integra* sp. nov.**
(Fig. 10A-B)

MATERIAL. HOLOTYPE: INDONESIA, IRIAN JAYA, P.T. Freeport Concession, Wapoga camp, 03.14°S, 136.57°E, 3450ft, 26.iv.1998, R.R. Snelling #98.201 (worker). Unique holotype in MLAC.

DESCRIPTION. *Worker.* Dimensions: TL c. 6.30; HL 1.65; HW 1.48; CI 90; SL 2.09; SI 141; PW 1.31; MTL 2.59.

Clypeus in profile almost straight, with short median carina just before rounding into medially impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with margins only moderately raised; central area with weakly impressed frontal furrow. Sides of head in front of eyes convex, anteriorly converging towards mandibular bases; behind eyes sides strongly converging into broad occipital margin. Eyes moderately convex, breaking lateral cephalic outline in full face view. Ocelli lacking; relative position of median ocellus indicated by shallow depression. Pronotum in dorsal view with sides widely rounded; greatest pronotal width at mid-length of segment. Mesosoma in profile with highly raised, strongly convex pronotum; promesonotal suture shallow but well defined; mesonotal dorsum almost straight; metanotal groove only faintly visible dorsally, in lateral view indicated by shallow depression in mesosomal outline; propodeum armed with pair of short, upturned, acute spines; declivity rather short, almost vertical. Petiole with anterior face straight, posterior face weakly convex; armed with pair of, acute dorsal teeth, situated close together, with tips bent backwards; pair of lateral teeth distinctly shorter. Subpetiolar process acute anteriorly, widely rounded posteriorly. Anterior face of first gastral segment lower than height of petiole, widely rounding onto dorsum of segment.

Mandibles very finely, longitudinally rugose. Head, mesosoma and gaster rather smooth, very finely shagreened, with numerous, shallow minute punctures. Intensity of sculpturation distinctly increasing laterally, lower portions of mesosoma, notably meso- and metapleurae and petiole, rather coarsely reticulate-rugose.

Several erect to semierect, short to medium length hairs fringing mandibular masticatory borders, numerous appressed hairs arising from pits towards mandibular bases. Anterior clypeal

margin with several relatively long, anteriorly directed setae medially and a few very short setae laterally. A few pairs of hairs near anterior and basal clypeal margins and along frontal carinae; single pair on vertex. Gaster with numerous medium length hairs along posterior margins of segments and around apcx. Sides of head, mesosoma, petiole and dorsum of first gastral segment completely hairless. Extremely short appressed pubescence, arising from pits and shallow minute punctures in various densities over all body surfaces.

Colour. Black; mandibular masticatory borders, condylae, extreme tips of apical funicular segments, joints between trochanters and femorae of mid and hind legs and tarsal claws medium to dark reddish-brown.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis integra* is similar to *P. goramensis* (Fig. 9A-B) from Indonesia. Both have a rather massive pronotum with widely rounded sides, the mesosomal dorsum rapidly descending from the summit of the pronotum to the declivity and short, but distinct, propodeal spines. However, they are easily distinguished, with *P. integra* having a distinctly higher pronotum, the mesonotum virtually straight in lateral view, and the lateral petiolar spines reduced to short teeth. In *P. goramensis* the mesonotal dorsum is convex in lateral view and the widely diverging lateral petiolar spines are more than twice as long as the dorsal pair.

***Polyrhachis kyawthani* sp. nov.**
(Fig. 10C-D)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, New Ireland Prov., East Coast, 3km S of Konos, 03°09'S, 151°43'E, <50m, 22.vii.1984, R.J. Kohout acc. 84.105 (worker). PARATYPES: data (and nest) as for holotype (58 workers, dealate ♀). Type deposition: Holotype, most paratype workers and paratype ♀ in ANIC; 2 paratype workers each in AMNH, BMNH, BPBM, CASC, MCZC, NMNH and QM. OTHER MATERIAL: PAPUA NEW GUINEA, New Ireland Prov., 50km from Kavieng, 50-130m, 3.vii.1959 (JLG) (w); 'Camp Bishop', 12km up Kait R., 240m, 15.vii.1956 (E.J. Ford, Jr) (w); Gillingil Pltn, 2m, 6.vii.1956 (JLG) (w).

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 7.06, 6.35-7.56; HL 1.65, 1.56-1.75; HW 1.56, 1.43-1.62; CI 94, 92-96; SL 2.15, 2.03-2.25; SI 138, 135-144; PW 1.25, 1.15-1.31; MTL 2.59, 1.59-2.71 (12 measured).

Clypeus in profile very weakly convex, narrowly rounding into weakly impressed basal

margin. Frontal triangle weakly indicated. Frontal carinae sinuate with weakly raised margins; central area rather flat with frontal furrow clearly indicated for most of its length. Sides of head in front of eyes very weakly convex, converging towards mandibular bases; behind eyes sides rounding into broadly convex occipital margin. Eyes weakly convex, in full face view not reaching lateral cephalic outline. Ocelli lacking, relative positions indicated by shallow punctures in sculpture. Pronotum in dorsal view widely rounded, humeri in some specimens subangular; greatest pronotal width at mid-length of segment. Mesosoma in lateral view with pronotum weakly convex, almost flat, narrowly rounding into weakly impressed promesonotal suture; mesonotal dorsum convex; metanotal groove indicated by shallow depression in outline and faint line in some specimens; propodeum unarmed, dorsum widely rounding into virtually vertical declivity. Petiole in profile biconvex; dorsum armed with rather small, acute, subequal teeth; tips of dorsal pair distinctly bent backwards. Subpetiolar process acute anteriorly, widely rounded posteriorly. First gastral segment with anterior face lower than apices of petiolar spines, widely rounding onto dorsum of segment.

Mandibles very finely rugose with piliferous pits, density reducing towards bases. Head, mesosoma and gaster finely shagreened dorsally; intensity of sculpturation increasing laterally with meso- and metapleurae reticulate-rugose. Petiole very finely, mostly transversely reticulate, distinctly reticulate-rugose around base. Rather shallow piliferous pits scattered over most body surfaces, but almost completely absent from rather polished dorsum of mesosoma.

Mandibles with numerous, medium length, curved hairs along masticatory borders. Anterior clypeal margin usually with 2 long, anteriorly directed setae medially and several rather short setae laterally. Mostly paired, medium length, erect hairs near anterior and basal clypeal margins and along frontal carinae; pair of long, somewhat forward-curved hairs on vertex. Pair of long, erect hairs on anterior faces of fore coxae, several shorter, somewhat isolated, erect hairs ventrally on trochanters and femora. Numerous, medium length, erect hairs along posterior margins of gastral segments, more abundant on ventral surfaces.

Colour. Black; mandibular teeth, condylae, tips of apical funicular segments and legs medium reddish-brown. Coxae and tarsi black. Apex of gaster diffusely reddish-brown.

Queen. Dimensions: TL c. 9.32; HL 2.09; HW 1.87; CI 89; SL 2.43; SI 130; PW 1.93; MTL 3.21 (1 measured). Apart from sexual characters, similar to worker except: pronotal humeri evenly and widely rounded; mesoscutum marginally wider than long, lateral margins distinctly converging anteriorly, forming distinctly narrowly rounded anterior margin; median line short, weakly indicated; parapsides rather flat, slightly raised posteriorly; mesoseutum in profile with widely rounded anterior face and very weakly convex dorsum. Mesoseutellum weakly convex, marginally elevated above dorsal plane of mesosoma; metanotal groove distinct. Propodeal dorsum weakly convex, rounding abruptly into virtually vertical declivity. Very fine body sculpturation, rather sporadic pilosity and polished appearance as in worker.

Males unknown. Immature stages (eggs, larvae and pupae) present in ANIC spirit collection.

REMARKS. *Polyrhachis kyawthani* is known only from New Ireland. The specimens of the type series were collected from a silk nest attached to the underside of a leaf on a low tree in rainforest. *Polyrhachis kyawthani* is very similar to *P. aporema* described above with the main characters distinguishing them listed under the latter.

Polyrhachis leonidas Forel, 1901

Polyrhachis leonidas Forel, 1901: 34. Syntype workers, queen. Type locality: BISMARCK ARCHIPELAGO, Mioko (F. Dahl). MHNG (examined).

Polyrhachis (Cyrtomyrma) leonidas Forel, Emery, 1925: 208; Donisthorpe, 1938: 267.

REMARKS. *Polyrhachis leonidas* is relatively similar to *P. barryi*, described above, with distinguishing characters listed under the latter. *Polyrhachis leonidas* appears to be a rather rare species apparently limited to the Bismarck Archipelago. Besides the types, I have only seen specimens collected by J.L. Gressitt at Keravat, Gazelle Pen. (East New Britain Prov., Papua New Guinea) (MCZC, BPBM, QM).

Polyrhachis levior Roger, 1863

Polyrhachis laevisinus Fr. Smith, 1859: 141. Holotype worker. Type locality: INDONESIA, Aru I. (A.R. Wallace), OXUM (examined). [Junior homonym of *P. laevisima* Fr. Smith, 1858:64].

Polyrhachis levior Roger, 1863: 8. Replacement name. *Polyrhachis rastellata* r. *laevior* Roger, Forel, 1893: 21 (variant spelling).

Polyrhachis (Cyrtomyrma) levior Roger, Forel, 1915: 110. Combination in *P. (Cyrtomyrma)*.

Polyrhachis (Cyrtomyrma) rastellata spp. *laevior* Roger, Emery, 1925: 208 (variant spelling).

Polyrhachis (*Cyrtomyrma*) *levior* Roger. Donisthorpe, 1938: 248, fig. 1. Reviewed status as species.

REMARKS. *Polyrhachis levior* is known only by the unique holotype (missing its head) from Aru I, Indonesia. Its distinctly bilobed pronotal humeri resemble those of *P. albertisi* Emery (see above). The mesosoma features a rather steeply raised pronotum and weakly convex mesonotum and propodeum. The promesonotal suture is distinct but the metanotal groove lacking, its position indicated only by a slight depression in the mesosomal outline. The propodeal spines are relatively long, somewhat dorso-ventrally compressed, directly dorso-laterally and posteriorly, with their bases set well apart. The dorsum of the petiole is furnished with four sharp teeth of equal length.

***Polyrhachis lineae* Donisthorpe, 1938**

Polyrhachis (*Cyrtomyrma*) *lineae* Donisthorpe, 1938: 262, fig. 12. Syntype workers, queens. Type locality: NEW GUINEA, Cyclops Mts, Mt Lina (L.E. Cheesman), BMNH, QM (examined).

REMARKS. *Polyrhachis lineae* is somewhat similar to *P. debilis*, but it differs by its larger size and more steeply convex pronotum that is widest just behind the narrowly rounded humeri. The propodeal spines are short, but distinct. In contrast, specimens of *P. debilis* are distinctly smaller with a weakly convex pronotal profile. The pronotal humeri are widely rounded and the propodeal spines very short, present as tuberculae or completely absent. *Polyrhachis lineae* appears to be a rather uncommon, but widespread, New Guinean species with several colonies collected recently by R. Snelling at the Lakekamu Basin (Gulf Prov., Papua New Guinea).

***Polyrhachis luctuosa* Emery, 1921
(Fig. 10G-H)**

Polyrhachis (*Cyrtomyrma*) *luctuosa* Emery, 1921: 25; Emery, 1925: 208; Donisthorpe, 1938: 261. Holotype worker. Type locality: NEW GUINEA (no further data), MCSN (examined).

REMARKS. *Polyrhachis luctuosa* is closely related to *P. inflata*, with both distinguished from all other known New Guinean species by the very closely reticulate-punctate sculpturation of their body, giving them a distinct, opaque appearance. However, *P. inflata* is easily distinguished from *P. luctuosa* by its exceptionally high pronotal dorsum which bears a well-defined, median, longitudinal furrow along its summit. The pronotum in *P. luctuosa* is not swollen and has no furrow on its summit. *Polyrhachis luctuosa* is apparently very rare and, besides the type, only

one additional specimen was collected by RWT at Hayfield nr Maprik (East Sepik Prov., Papua New Guinea).

***Polyrhachis mondoi* Donisthorpe, 1938**

Polyrhachis (*Cyrtomyrma*) *mondoi* Donisthorpe, 1938: 250, fig. 3. Holotype worker. Type locality: NEW GUINEA, PAPUA, Mondo (L.E. Cheesman), BMNH (examined).

REMARKS. *Polyrhachis mondoi* is somewhat similar to *P. australis* from Australia, but differs in several characters. In dorsal view, the pronotum is strongly transverse and widest just behind the distinctly angular humeri. The mesonotal and propodeal dorsa are somewhat laterally compressed with their sides strongly converging posteriorly. In profile, the mesonotum and propodeum are gently sinuate, with the promesonotal suture distinctly impressed and the indistinct metanotal groove indicated by a weak depression. The propodeal spines are rather short and strongly upturned, and propodeal dorsum slopes into the declivity in an even curve. The petiole is armed with four subequal spines. In contrast, the pronotal humeri in *P. australis* are obtusely angular or narrowly rounded and the sides of the mesosoma are not as strongly laterally compressed. The propodeal spines of *P. australis* are longer and only weakly upturned, and the lateral petiolar spines are distinctly longer than the dorsal pair. *Polyrhachis mondoi* is a relatively common species at suitable localities in New Guinea. It is normally an arboreal nesting species but one colony has been collected from under the bark of a living tree.

***Polyrhachis nomo* Donisthorpe, 1941 stat. nov.
(Fig. 10G-H)**

Polyrhachis (*Cyrtomyrma*) *rastellata* var. *nomo* Donisthorpe, 1941: 142. Syntype workers. Type locality: NEW GUINEA, Mt Nomo, S of Bougainville (L.E. Cheesman), BMNH, MCZC (examined).

REMARKS. *Polyrhachis nomo* is distinct from *P. rastellata* in having all surfaces of the body covered with short, appressed and decumbent hairs. The pronotal shoulders are widely rounded and the lateral petiolar margins strongly diverging, terminating in slender, acute spines that are distinctly longer than the dorsal pair. In contrast, the pilosity in *P. rastellata* consists of a few scattered hairs on the head, apical portion of the gaster and a tuft of hairs on the summit of the mesosoma. The pronotal dorsum in *P. rastellata* is widest across or just below the narrowly rounded or bluntly angular shoulders. The lateral margins of the petiole are only weakly diverging with

the lateral petiolar spines broad-based and rather short. *Polyrhachis nomo* closely resembles *P. decumbens* from Queensland, described above. Both have a characteristic pile of short, decumbent hairs covering most of the body. Characters distinguishing these two species are described in detail under *P. decumbens*.

***Polyrhachis ralumensis* Forel, 1901**

Polyrhachis ralumensis Forel, 1901: 34. Holotype worker. Type locality: BISMARCK ARCHIPELAGO, Ralum (F. Dahl), MHNG (examined).

Polyrhachis rastellata var. *major* Sütz. Viehmeyer, 1914: 50. Junior synonym of *ralumensis*.

Polyrhachis (*Cyrtomyrma*) *ralumensis* Forel, Emery, 1925: 208; Donisthorpe, 1938: 257.

REMARKS. *Polyrhachis ralumensis* is easily distinguished from other species of *Cyrtomyrma* from the Bismarck Archipelago by its large size and exceptionally broad head. It also features three distinct ocelli that are absent in workers of the other species. *Polyrhachis ralumensis* is endemic to the Bismarck Archipelago with the holotype and the syntypes of *P. rastellata* var. *major* collected at neighbouring localities (Ralum and Herbertshöhe, New Britain Province).

***Polyrhachis sedlaceki* sp. nov.**
(Fig. 11A-B)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Bulolo R. Valley, c. 5 km N of Wau, 07°17'S, 146°42'E, c. 1000m, 12.vi.1963, rf., J. & M. Sedláček (worker). PARATYPE: data as for holotype (worker). Type deposition: Holotype (Type QMT99346) in QM, paratype in ANIC.

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 5.29, 5.59; HL 1.37, 1.40; HW 1.37, 1.40; CI 100, 100; SL 1.62, 1.65; SI 118, 118; PW 1.00, 1.03; MTL 1.93, 1.96 (2 measured).

Clypeus convex in profile, narrowly rounding into medially impressed basal margin. Frontal triangle only weakly impressed. Frontal carinae sinuate with rather flat margins; central area with short frontal furrow. Sides of head in front of eyes weakly convex, strongly converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri weakly rounded; greatest pronotal width at mid-length of segment. Mesosoma in profile with pronotum strongly convex; promesonotal suture distinct, rather flat; mesonotal and propodeal dorsa weakly convex, rounding into declivity in even curve; metanotal groove lacking. Petiole

with anterior face rounding onto rather blunt dorsal margin, posterior face convex; lateral spines long, slender, directed backwards; dorsal pair reduced to minute denticles. Subpetiolar process acute anteriorly, angular posteriorly. Anterior face of first gastral segment higher than dorsum of petiole, narrowly rounding onto dorsum of segment.

Mandibles very finely, superficially sculptured. All body surfaces highly polished, with only very fine, microscopic sculpturation and numerous, very shallow piliferous pits.

Mandibles with several rather short, semicrect hairs near masticatory borders. Anterior clypeal margin with a few, anteriorly directed setae medially and several shorter setae laterally. A few, medium length, erect hairs fringing apex of gaster. Extremely short, appressed hairs, arising from numerous pits, in various densities, over all body surfaces.

Colour. Black; mandibles reddish-brown with masticatory borders a shade lighter. Antennae dark brown with distal ends of scapes yellowish-brown and funicular segments progressively lighter towards apex. Legs and gaster rather dark, reddish-brown; tarsi very dark brown.

Sexuals and immature stages unknown.

REMARKS. The holotype and paratype are the only specimens known of this spectacular species and nothing is known about its nesting habits. *Polyrhachis sedlaceki* is easily distinguished from all other New Guinean *Cyrtomyrma* by its highly polished appearance and complete lack of dorsal pilosity. It also differs in the unique shape of the petiole that is armed with two long, posterolaterally directed spines. All other known New Guinean species feature a normal scale-like petiole.

***Polyrhachis strumosa* sp. nov.**
(Fig. 11E-F)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, East Sepik Prov., Maprik, 03°36'S, 143°03'E, 150m, 29.xii.-17.i.1960, T.C. Maa (worker). PARATYPES: data as for holotype (7 workers). Type deposition: Holotype and 1 paratype in MCZC; 2 paratypes in BMNH; 1 paratype each in ANIC, BPBM, CASC and QM.

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 6.80, 6.30-7.26; HL 1.68, 1.53-1.72; HW 1.62, 1.53-1.65; CI 96, 94-96; SL 2.28, 2.11-2.34; SI 141, 137-143; PW 1.50, 1.29-1.54; MTL 2.71, 2.53-2.84 (8 measured).

Clypeus in profile weakly convex, posteriorly rounding into rather flat basal margin. Frontal triangle indistinct. Frontal carinae sinuate with raised margins; central area concave medially with rather distinct frontal furrow. Sides of head in front of eyes convex, converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view marginally exceeding lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri distinctly subangular; greatest width of pronotal dorsum just behind shoulders. Mesosoma in profile with pronotum rising towards short summit in rather steep, almost straight line; promesonotal suture distinct; mesonotal dorsum very weakly convex, sloping down posteriorly to feebly indicated metanotal groove; propodeal dorsum weakly convex, rounding into relatively high, virtually vertical declivity. Petiole very broad, transverse, anterior face in profile almost straight, posterior face weakly convex; dorsum armed with four spines; lateral pair slightly longer. Subpetiolar process anteriorly acute, weakly concave posteriorly. Anterior face of first gastral segment straight, narrowly rounding onto dorsum of segment.

Mandibles longitudinally rugose with numerous piliferous pits. Head, mesosoma and gaster shagreened, sculptural intensity increasing laterally to become reticulate-rugose, notably on meso- and metapleurae. Petiole finely, mostly transversely wrinkled dorsally, sculpture coarser at base. Numerous shallow punctures and piliferous pits in various densities over all dorsal surfaces.

Mandibles with several short semierect hairs at masticatory borders. Anterior clypeal margin with a few anteriorly directed setae medially and very few shorter setae laterally. A few pairs of medium length, erect hairs near anterior and basal clypeal margins and along frontal carinae. Gaster with numerous, medium length, erect hairs lining posterior margins of apical segments, more abundant on ventral surfaces.

Colour. Black; mandibular teeth, condylae and distal ends of antennal scapes reddish-brown. Funiculi brown with distal segments progressively lighter towards apices; tip of apical segments light yellowish-brown. Legs medium to dark reddish-brown with fore and middle tibiae a shade lighter; tarsi very dark brown or black.

Sexuals and immature stages unknown.

REMARKS. The type series from Maprik are the only known specimens of *P. strumosa* and

its nesting habits are unknown. With its rather massive mesosoma, *P. strumosa* is similar to *P. hybosa*, described above. However, they differ in a number of characters, including the outline of mesosoma which, in *P. strumosa*, features a very short pronotal summit and rather high propodeal declivity. In *P. hybosa* the summit of pronotal dorsum is longer and the propodeal declivity distinctly lower. Also, the pronotal dorsum in *P. strumosa* is widest just behind the more-or-less angular humeri, while the pronotal humeri in *P. hybosa* are widely rounded with the pronotal dorsum widest at its mid-length. The petiolar scale in *P. strumosa* is distinctly transverse, while it is virtually quadrate in *P. hybosa*.

***Polyrhachis tuberosa* sp. nov.**
(Fig. 11G-H)

MATERIAL. HOLOTYPE: PAPUA NEW GUINEA, Milne Bay Prov., Puni Puni Point, 10°12'S, 150°27'E, 24.ix.1960, A. Catley (worker). PARATYPES: data as for holotype (8 workers). Type deposition: Holotype and 2 paratypes in MCZC; 2 paratypes in BMNH; 1 paratype each in ANIC, BPBM, CASC and QM.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 6.25, 5.80-6.70; HL 1.62, 1.56-1.72; HW 1.56, 1.50-1.72; CI 96, 96-98; SL 1.90, 1.84-2.00; SI 122, 117-123; PW 1.15, 1.12-1.28; MTL 2.25, 2.15-2.34 (9 measured).

Clypeus in profile weakly convex, narrowly rounding posteriorly into rather shallow basal margin. Frontal triangle indistinct. Frontal carinae sinuate with raised margins; central area medially concave with distinct frontal furrow. Sides of head in front of eyes weakly convex, converging towards mandibular bases; behind eyes sides rounding into convex occipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri widely rounded; greatest pronotal width at mid-length of segment. Mesosoma in profile with pronotum relatively high, ascending towards rather short summit in very weakly curved line; promesonotal suture distinct, flat in profile; mesonotal dorsum weakly convex; metanotal groove very faintly indicated; propodeal dorsum descending into rather low, oblique declivity in widely open curve. Petiole with anterior face very weakly convex, almost flat; posterior face distinctly convex; dorsum armed with four, rather short, subequal teeth. Subpetiolar process acute anteriorly, bluntly angular posteriorly. Anterior face of first gastral

segment marginally higher than petiole, evenly rounding onto dorsum of segment.

Mandibles very finely, irregularly rugose with shallow piliferous pits. Head, mesosoma and gaster shagreened; intensity of sculpturation increasing laterally, becoming weakly reticulate-rugose on sides of pronotum and mesosoma with meso- and metapleurae more distinctly sculptured. Petiole finely reticulate dorsally, lower portions more heavily sculptured. Numerous, rather shallow punctures and piliferous pits over most body surfaces.

Mandibles with numerous semierect and curved hairs on masticatory borders. Anterior clypeal margin with usually 2, relatively long, anteriorly directed setae medially and fringe of shorter setae laterally. A few pairs of medium length, erect hairs near anterior and basal clypeal margins and along frontal carinae; single pair of slightly longer hairs on vertex. Summit of mesonotal dorsum with tuft of a few, relatively long, variously curved hairs. Gaster with numerous, erect, somewhat posteriorly directed hairs lining posterior margins of segments, hairs more abundant on ventral surfaces.

Color: Black; mandibular masticatory borders, condylae and tips of apical funicular segments light reddish- or yellowish-brown. Legs medium to very dark reddish-brown, almost black in some specimens, with distal ends of trochanters and most of tibiae a shade lighter; tarsi and proximal ends of tibiae narrowly black. Gastral segments in most specimens with posterior margins somewhat diffusely reddish-brown.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis tuberosa* is known only from the type locality. According to the data label, specimens of the type series were collected 'ex nest upon pawpaw leaves in association with *Amblyopelta lutescens papuensis* Brown'. *Polyrhachis tuberosa* belongs to a group of species of rather similar appearance that are collectively identified as '*rastellata*' (sensu lato), with their taxonomy presently under review. However, *P. tuberosa* can be easily separated from *P. rastellata* by its high, strongly convex mesosoma with the anterior face of the pronotum ascending towards its summit in an almost straight line. In contrast the outline of the mesosoma in *P. rastellata* is lower

and more uniformly rounded with the anterior face of the pronotal dorsum distinctly convex. Also, the pronotal humeri in *P. tuberosa* are widely rounded, while in *P. rastellata* the humeri are subangular with the greatest width of the pronotal dorsum across, or just behind the shoulders. The legs in *P. tuberosa* are quite dark reddish-brown, or almost black, while in *P. rastellata* the legs are very light red or orange.

Polyrhachis wagneri Viehmeyer, 1914

Polyrhachis wagneri Viehmeyer, 1914: 51, fig. 10. Holotype worker. Type locality: NEW GUINEA, Wareo, MNHU (examined).

Polyrhachis (Cyrtomyrma) wagneri Viehmeyer. Emery, 1925: 208; Donisthorpe, 1938: 263.

REMARKS. *Polyrhachis wagneri* is relatively similar to *P. leonidas* from the Bismarck Archipelago from which it differs by a distinctly smaller head, higher and more convex pronotum and very short, tooth-like propodeal spines. The petiole is exceptionally broad with widely diverging lateral spines. *Polyrhachis wagneri* appears to be rare, with only one recent specimen, collected by RWT at Yawasora nr Wewak (East Sepik Province, Papua New Guinea), available for examination. Although Viehmeyer listed only one specimen in the original description, there are four specimens in the MNHU labelled as types.

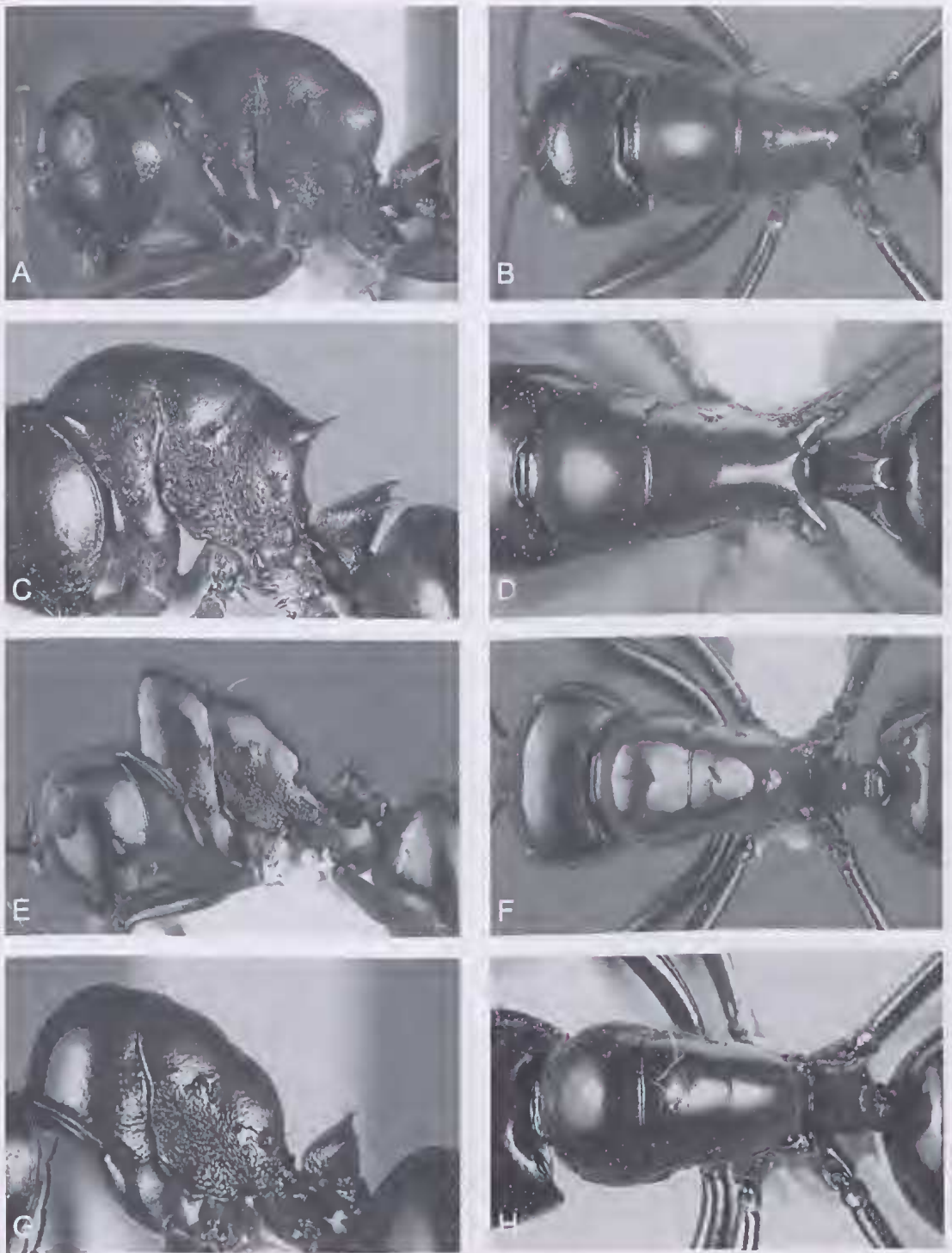


FIG. 8. *Polyrhachis* (*Cyrtomyrma*) species from New Guinea, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. aporema* sp. nov.; C-D, *P. barryi* sp. nov.; E-F, *P. conspicua* sp. nov.; G-H, *P. dorsena* sp. nov.

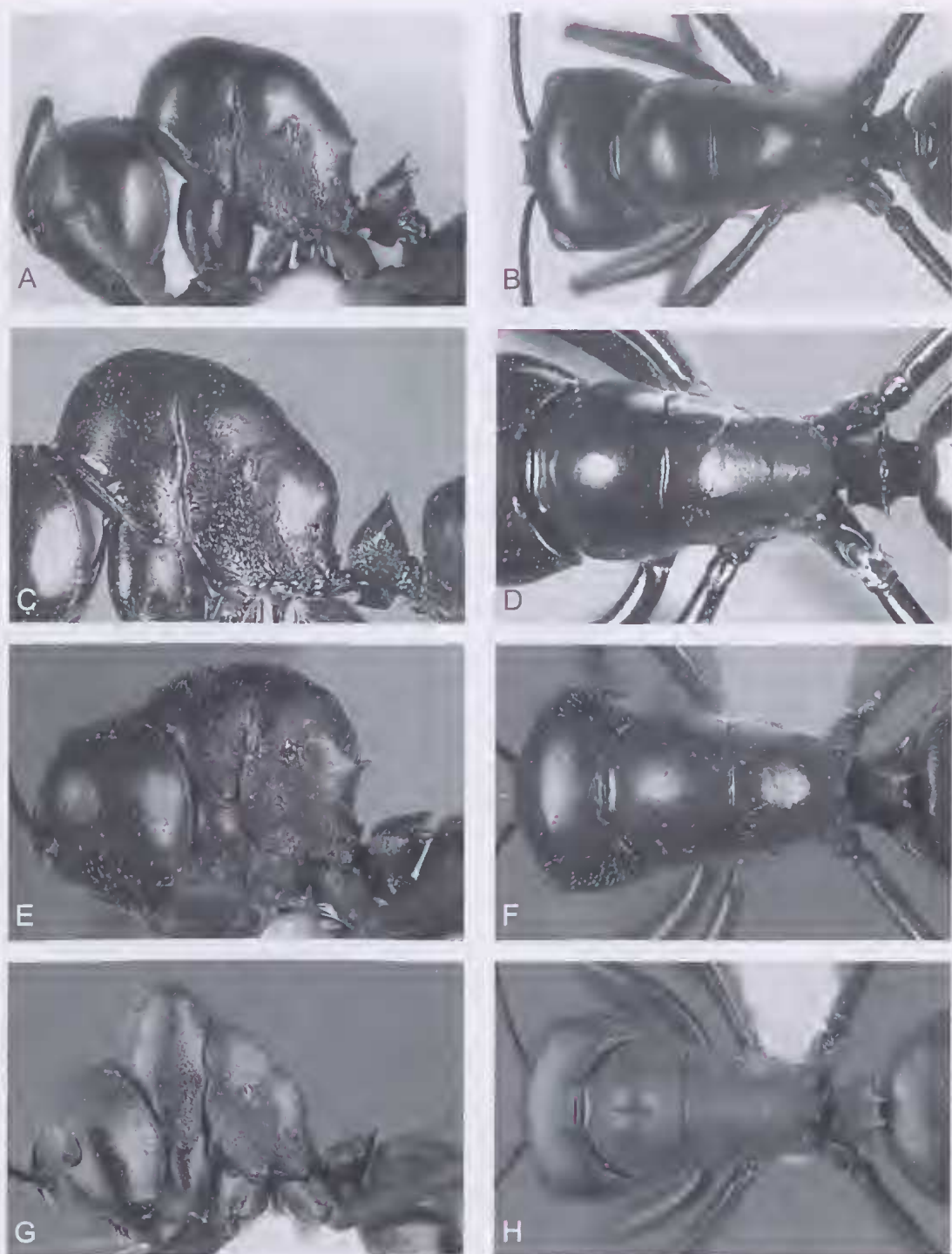


FIG. 9. *Polyrhachis* (*Cyrtomyrma*) species from Seram Island and New Guinea, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. goramensis* Emery; C-D, *P. hybosa* sp. nov.; E-F, *P. inducta* sp. nov.; G-H, *P. inflata* sp. nov.

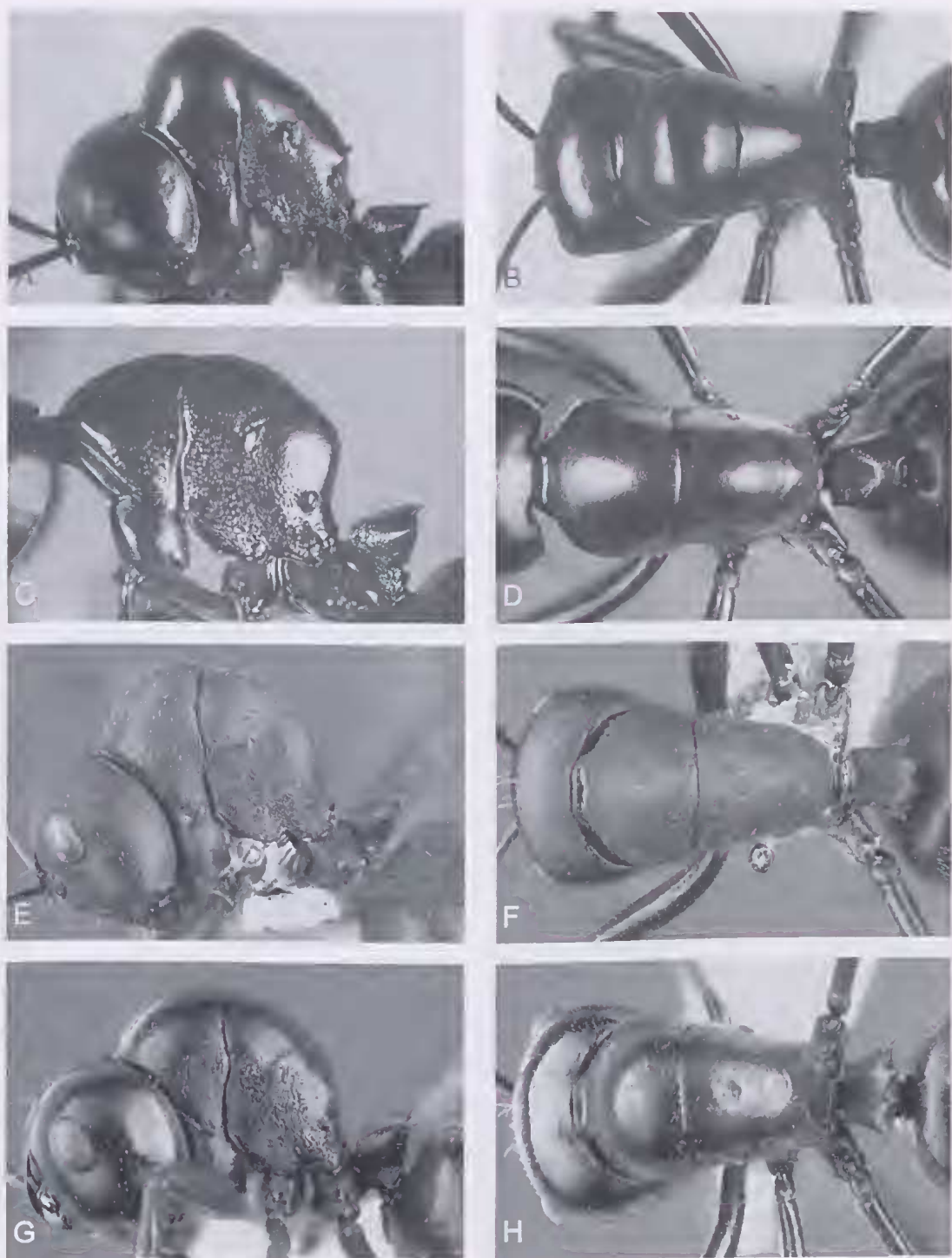


FIG. 10. *Polyrhachis* (*Cyrtomyrma*) species from New Guinea, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. integra* sp. nov.; C-D, *P. kyawthani* sp. nov.; E-F, *P. luctuosa* Emery; G-H, *P. nomo* Donisthorpe.

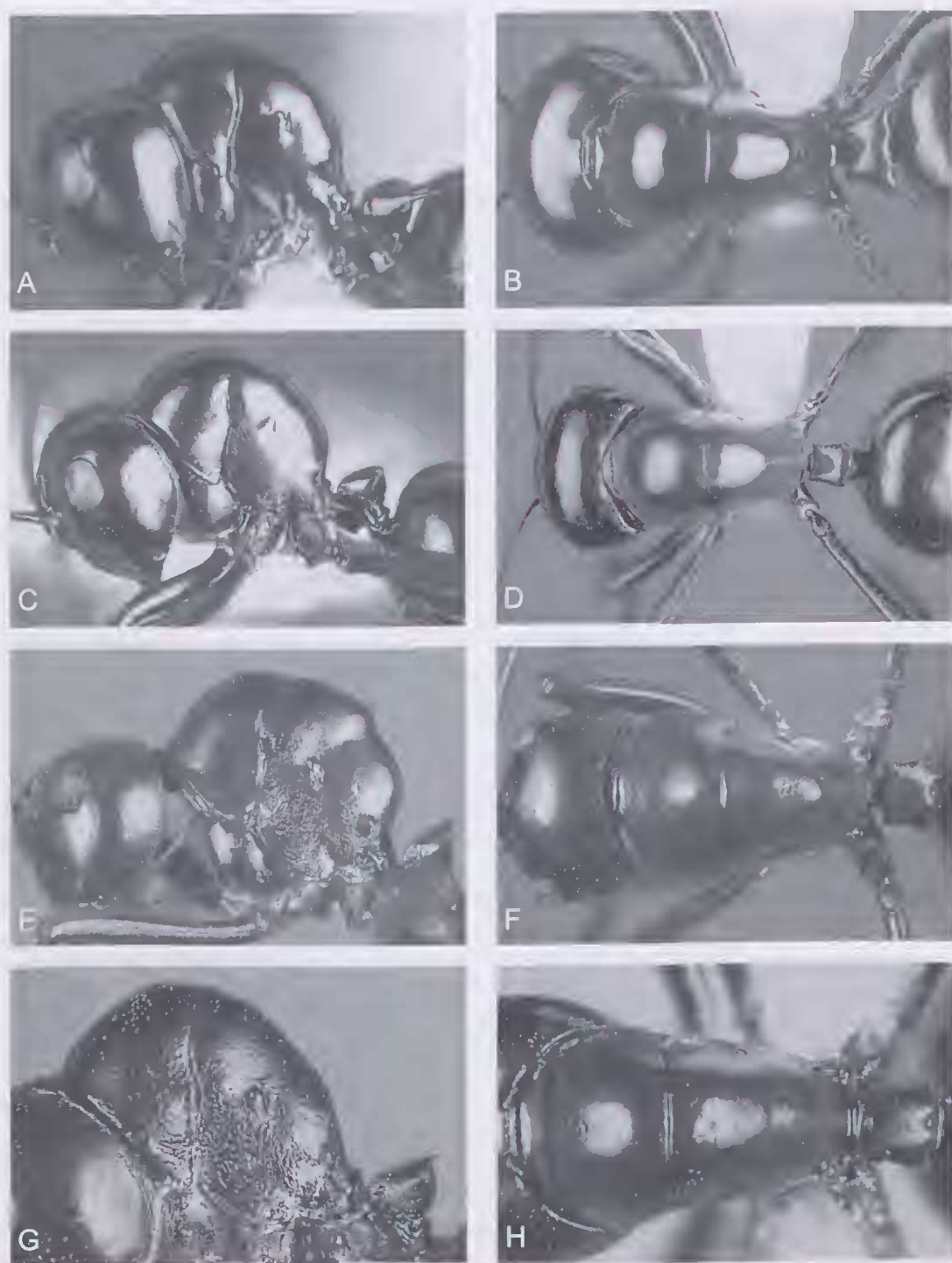


FIG. 11. *Polyrhachis* (*Cyrtonymra*) species from New Guinea and the Philippines, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. sedlaceki* sp. nov.; C-D, *P. semiinermis* Donisthorpe; E-F, *P. strumosa* sp. nov.; G-H, *P. tuberosa* sp. nov.

CHECKLIST OF *CYRTOMYRMA* SPECIES FROM THE SOLOMON ISLANDS

P. emeryana Mann*P. fulakora* Mann*P. johnsoni* Mann*P. pacifica* sp. nov.*P. setosa* sp. nov.*P. ngiensis* Mann*P. nudilata* sp. nov.

Mann (1919) described *Polyrhachis* (*Cyrtomyrma*) *johnsoni*, *P. fulakora* and *P. ugiensis* as subspecies (varieties) of *P. rastellata* (Latreille). Donisthorpe (1938) raised *P. ugiensis* to specific status and I also consider *P. johnsoni* to be a 'good' species. Despite the status of *P. fulakora* being unresolved, I do not consider it a synonym of *P. rastellata* and have also elevated it to species level. Because all available species-group names have identical status according to the code, regardless of their rank, assigning of species status to the names of unresolved taxa seems a reasonable course to follow.

KEY TO *CYRTOMYRMA* SPECIES FROM THE SOLOMONS (BASED ON WORKER CASTE)

1. Dorsum of mesosoma more-or-less evenly convex in outline 2

Dorsum of mesosoma distinctly higher anteriorly, descending posteriorly in uneven, undulating outline (Fig. 12A, C, E, G) 4

2. Propodeal dorsum with pair of small teeth or tubercles; propodeal declivity very steep, virtually vertical, weakly concave at base *johnsoni* Mann

Propodeal dorsum without teeth or tubercles; propodeal declivity oblique to main axis of body. 3

3. Generally larger species (HL >1.68); petiole with well developed, acute, subequal spines *fulakora* Mann

Generally smaller species (HL <1.53); petiole rather narrow, almost parallel-sided, with short, tooth-like spines *ugiensis* Mann

4. Pronotal humeri distinctly angular or subangular (Fig. 12D, H) 5

Pronotal humeri widely rounded (Fig. 12B, F) 6

5. Propodeum with pair of acute spines; mesosoma in profile with pronotal dorsum distinctly higher than summit of mesonotum (Fig. 12C) *pacifica* sp. nov.

Propodeum without spines; mesosoma in profile with summit of mesonotum distinctly higher than pronotal dorsum (Fig. 12G) *nudilata* sp. nov.

6. Promesonotal suture situated at bottom of deep impression (Fig. 12A); propodeum with short, acute, upturned

spines (Fig. 12A); whole body with abundant, closely appressed hairs *emeryana* Mann

Promesonotal suture not within impression (Fig. 12E); propodeum unarmed or, at most, with pair of very short spines or tuberculae; whole body covered with very abundant, short, erect, bristle-like hairs and rather short, decumbent hairs (Fig. 12E) *setosa* sp. nov.

Polyrhachis emeryana Mann, 1919 (Fig. 12A-B)

Polyrhachis (*Cyrtomyrma*) *emeryana* Mann, 1919: 390, fig. 59; Emery, 1925: 207; Donisthorpe, 1938: 263. Holotype worker. Type locality: SOLOMON IS., Malaita, Auki (W.M. Mann) (location of type unknown).

REMARKS. *Polyrhachis emeryana* is very similar to *P. expressa* from Cape York Peninsula, described above, with distinguishing characters listed under the latter. In lieu of the apparently misplaced holotype, my concept of the species is based on a voucher specimen (BMNH) evidently compared with the holotype by Than (1978), and a few additional specimens collected by P. Greenslade at Mt Austen (Guadalcanal, Solomon Is) (ANIC, QM). *Polyrhachis emeryana* appears to be rare and restricted to the Solomons.

Polyrhachis fulakora Mann, 1919 stat. nov.

Polyrhachis (*Cyrtomyrma*) *rastellata* var. *fulakora* Mann, 1919: 389; Emery, 1925: 208; Donisthorpe, 1938: 257. Syntype workers. Type locality: SOLOMON IS., Ysabel I., Fulakora (W.M. Mann), MCZC, NMNH, QM (examined).

REMARKS. Although described as a variety of *P. rastellata*, *P. fulakora* is most similar to *P. ugiensis* Mann, also from the Solomons. I have directly compared numerous syntypes of both species and believe that they represent separate, although very similar, species. In outline, the pronotal dorsum of *P. ugiensis* is much more convex, especially anteriorly, where it rises from the pronotal collar almost vertically for a short distance and then continues in a convex outline to the promesonotal suture. In contrast, the pronotal dorsum in *P. fulakora* is only weakly convex from the pronotal collar to the promesonotal suture. Also, the lateral petiolar spines in *P. ugiensis* are greatly reduced, while the petiolar spines in *P. fulakora* are more-or-less subequal. Both species differ from the closely allied *P. johnsoni* Mann in having the greatest width of the pronotal dorsum at, or about, the middle of its length. In *P. johnsoni* the greatest width of the pronotal dorsum is across, or just below the humeri. *Polyrhachis fulakora* appears to be endemic to the Solomon Islands.

***Polyrhachis johnsoni* Mann, 1919 stat. nov.**

Polyrhachis (Cyratomyrma) rastellata var. *johnsoni* Mann, 1919: 390; Emery, 1925: 208. Syntype workers. Type locality: SOLOMON IS., Rendova (W.M. Mann) MCZC, NMNH, BMNH (examined).

Polyrhachis (Cyratomyrma) debilis var. *johnsoni* Mann. Donisthorpe, 1938: 266.

REMARKS. *Polyrhachis johnsoni* was originally described as a variety of *P. rastellata*, but was treated by Donisthorpe (1838) as a variety of *P. debilis*. *Polyrhachis johnsoni* is certainly more closely related to *P. debilis* than to *P. rastellata* but can be easily distinguished from both by the outline of pronotum. In *P. johnsoni* the pronotal dorsum is rather flat, while it is distinctly convex in the other two species. From *P. rastellata* it also differs by the presence of distinct, though short, propodeal spines or tubercles. From *P. debilis* it differs primarily by its distinctly larger size (HL 1.72-1.87 in *P. johnsoni* syntypes versus 1.34-1.47 in *P. debilis* syntypes) and by the propodeal declivity that is almost as high as the full height of the petiole. In *P. debilis* the propodeal declivity is relatively low, with its dorsal margin barely reaching the level of the bases of the dorsal petiolar teeth. The known distribution of *P. johnsoni* appears to be limited to the Solomon Islands, but there are a few unconfirmed records from the East Britain Province of Papua New Guinea. Due to the uncertain nature of these records, *P. johnsoni* has not been included in the checklist and key to the New Guinean species of *Cyratomyrma*.

***Polyrhachis pacifica* sp. nov.**
(Fig. 12C-D)

MATERIAL. HOLOTYPE: SOLOMON IS., GUADALCANAL, Gold Ridge, 800m, 23.vi.1956, J.L. Gressitt (worker). PARATYPE: BOUGAINVILLE (S), Guaba, 720m, 19.vi.1956, E.J. Ford Jr. (worker). Type deposition: Holotype in MCZC; paratype in BMNH.

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 5.09, 4.94; HL 1.34, 1.28; HW 1.31, 1.28; CI 98, 99; SL 1.50, 1.43; SI 114, 112; PW 1.15, 1.03; MTL 1.72, 1.62 (2 measured).

Clypeus in profile straight, narrowly rounding into impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with weakly raised margins; central area rather flat with short frontal furrow. Sides of head in front of eyes weakly convex, converging towards mandibular bases; behind eyes sides rounding into moderately convex occipital margin. Eyes moderately convex, in full face view just reaching lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view widest

across distinctly angular humeri. Mesosoma in profile with pronotal dorsum strongly convex; mesosoma posteriorly descending from summit of pronotum in rather uneven outline, weakly impressed at promesonotal suture and distinctly stepped at metanotal groove; propodeal dorsum descending abruptly into steep, very weakly concave declivity; propodeum armed with pair of slender, acute, upturned, dorso-laterally directed spines. Petiole with anterior face straight, posterior face convex; dorsum armed with four acute spines, lateral pair distinctly more slender and almost twice as long as dorsal pair. Anterior face of first gastral segment lower than total height of petiole, base very weakly concave.

Mandibles very finely rugose with numerous piliferous pits. Head, mesosoma and gaster shagreened with numerous shallow punctures. Intensity of sculpturation increasing only marginally towards sides of pronotum and lateral portions of mesosoma, with meso- and metapleurae somewhat irregularly reticulate. Petiole with both faces finely transversely wrinkled.

Mandibles near masticatory borders with only a few, semierect, short hairs. Anterior clypeal margin with 3 relatively long, anteriorly directed setae and 4 erect hairs arising just behind anterior margin. A few medium length hairs on extreme apex and ventral surfaces of apical gastral segments. Rest of body virtually hairless, except for numerous microscopic decumbent hairs arising from shallow pits.

Colour. Black; mandibular masticatory borders, condylae, extreme tips of apical funicular segments, distal ends of trochanters, most of tibiae and gastral apex, light to medium reddish-brown. Rest of legs, including tarsi, distinctly darker.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis pacifica* is known only from the two collection localities of the types and nothing is known about its nesting habits. *Polyrhachis pacifica* is somewhat similar to *P. emeryana*. They share the highly convex pronotum with the mesonotum and propodeum descending posteriorly in an uneven, stepped outline. They differ in the shape of the pronotal humeri that, in *P. pacifica* are distinctly angular, while they are widely rounded in *P. emeryana*. *Polyrhachis undulata*, described below, is also similar, sharing the unevenly descending mesosomal profile. It differs from *P. pacifica* by a complete lack of propodeal spines and from *P. emeryana* by distinctly angular pronotal humeri.

Polyrhachis undulata also differs from both by its larger size (HL 1.53-1.59 in *P. undulata* versus 1.28-1.34 in *P. pacifica* and 1.34-1.40 in *P. emeryana*) and in having the mesonotal dorsum distinctly higher than the pronotum. In *P. pacifica* and *P. emeryana* the summit of the pronotal dorsum is the highest point of mesosoma.

***Polyrhachis setosa* sp. nov.**
(Fig. 12E-F)

MATERIAL. HOLOTYPE: SOLOMON IS, GUADALCANAL, Mt Austen, 09°29'S, 159°59'E, 13.x.1965, P.J.M. Greenslade acc. 29691 (worker). PARATYPES: data as for holotype (4 workers); ditto, Mt Austen Rd, 11.ii.1965, P.J.M. Greenslade acc. 15721 (dealate ♀). Type deposition: Holotype worker and paratype ♀ in ANIC; 1 paratype worker each in BMNH, MCZC and QM.

DESCRIPTION. *Worker.* Dimensions (holotype cited first): TL c. 4.89, 4.89-5.09; HL 1.28, 1.28-1.34; HW 1.25, 1.25-1.31; CI 98, 98; SL 1.50, 1.43-1.56; SI 120, 114-120; PW 0.94, 0.94-0.97; MTL 1.78, 1.72-1.84 (4 measured).

Apical mandibular tooth long, other teeth shorter and subequal. Anterior clypeal margin with central flange irregularly serrated. Clypeus in profile straight anteriorly, posteriorly rounding into well impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate with very weakly raised margins; central area rather flat with short, weakly indicated frontal furrow. Sides of head in front of eyes convex, rather strongly converging towards mandibular bases; behind eyes sides widely rounding into convex occipital margin. Eyes weakly convex, in full face view not, or just, reaching lateral cephalic outline. Ocelli lacking. Pronotum in dorsal view with humeri narrowly rounded or very weakly angular in some specimens; greatest width of pronotum across or just behind shoulders. Mesosoma in profile with moderately convex pronotum; promesonotal suture rather distinct; mesonotal dorsum weakly convex; metanotal groove indicated by shallow depression in outline; propodeal dorsum flat with pair of rather indistinct spines or tuberculae; propodeal declivity virtually vertical. Petiole with anterior face straight, posterior face convex; dorsum armed with four short spines of subequal length; dorsal pair broad-based, more tooth-like; lateral pair distinctly more slender. Subpetiolar process almost as wide as long with anterior angle acute, narrowly rounded posteriorly. Anterior face of first gastral segment very weakly concave at base.

Mandibles finely rugose with numerous piliferous pits. Head, mesosoma and gaster shagreened with numerous punctures; sculpturation somewhat more intense laterally with meso- and metapleurae distinctly reticulate-rugose.

Mandibles with numerous, short, mostly decumbent hairs at mandibular bases; longer, semierect hairs arising near masticatory borders. Virtually all body surfaces, including antennal scapes and legs, with numerous erect, bristle-like hairs and rather short, decumbent hairs arising from abundant punctures and pits.

Colour: Black; mandibles, condylae, distal half of apical funicular segments and trochanters light to medium reddish-brown. Antennal scapes dark brown, progressively lighter towards apex, including funiculi. Legs generally medium to dark reddish-brown; tarsi black. Gaster ventrally very dark reddish-brown.

Queen. Dimensions: TL c. 5.90; HL 1.40; HW 1.28; CI 91; SL 1.68; SI 131; PW 1.34; MTL 2.09 (1 measured). Apart from sexual characters, similar to worker except: pronotal humeri rounded; mesoseutum almost as long as wide with lateral margins converging anteriorly, forming evenly rounded anterior margin; median line weakly indicated; parapsides flat anteriorly, weakly raised posteriorly; mesoscutum in profile with rounded anterior face and very weakly convex dorsum. Mesoscutellum distinctly more convex, moderately raised above dorsal plane of mesosoma; metanotal groove distinct. Propodeum with pair of distinct teeth; dorsum convex in outline, medially rounding into virtually vertical declivity in uninterrupted curve. Petiole relatively narrow, parallel-sided in dorsal view, armed with four, subequal teeth. Other characters virtually identical to those of worker.

Male and immature stages unknown.

REMARKS. *Polyrhachis setosa* is known only from the type locality and its nesting habits are unknown. In many aspects *P. setosa* is similar to *P. decumbens*, from Australia, described above. They differ in the form of their pubescence which in *P. setosa* is mostly erect and bristle-like, while it is shorter and mostly decumbent in *P. decumbens*. Additionally, in *P. setosa* the eyes in full face view do not or only just reach the lateral cephalic outline, while in *P. decumbens* they clearly break the outline of the head.

***Polyrhachis ugiensis* Mann, 1919**

Polyrhachis (Cyrtomyrma) rastellata subsp. *ugiensis* Mann, 1919: 389; Emery, 1925: 208. Syntype workers. Original localities: SOLOMON IS, Ugi, Pawa; San Cristoval, Wai-ai, Pamua, Wainoni Bay; Three Sisters, Malapaina (W.M. Mann), MCZC, MLAC, QM, USNM (examined).

Polyrhachis (Cyrtomyrma) ugiensis Mann, Donisthorpe, 1938: 260. Raised to species.

REMARKS. *Polyrhachis ugiensis* was raised to species level by Donisthorpe (1938) and following the examination of numerous syntypes and additional specimens, I agree with his decision. *Polyrhachis ugiensis* is rather similar to *P. fulakora* with distinguishing characters listed under the latter.

***Polyrhachis undulata* sp. nov.**
(Fig. 12G-H)

MATERIAL. HOLOTYPE: SOLOMON IS, Guadalcanal, Mt Austen, 09°29'S, 159°59'E, 13.xi.1964, P.J.M. Greenslade #15093 (worker). PARATYPES: data as for holotype (1 worker); data as for holotype, except 21.iv.1965, P.J.M. Greenslade #16888 (3 workers). Type deposition: Holotype and 1 paratype in ANIC, 1 paratype each in BMNH, MCZC and QM.

DESCRIPTION. *Worker*. Dimensions (holotype cited first): TL c. 6.30, 6.00-6.35; HL 1.59, 1.53-1.59; HW 1.50, 1.43-1.50; CI 94, 92-94; SL 1.72, 1.59-1.72; SI 115, 111-117; PW 1.25, 1.12-1.25; MTL 2.09, 2.00-2.09 (3 measured).

Clypeus in profile very weakly, evenly convex with weakly and narrowly impressed basal margin, indicated laterally by distinct line. Frontal triangle weakly impressed. Frontal carinae sinuate with weakly raised margins; central area weakly concave medially with rather faint frontal furrow. Sides of head in front of eyes straight, converging towards mandibular bases; behind eyes sides rounding into moderately convex occipital margin. Eyes moderately convex, in full face view just reaching or, at most, only marginally breaking lateral cephalic outline. Ocelli lacking; relative position of median ocellus indicated by small pit in cephalic sculpture. Pronotum in dorsal view with humeri obtusely angular. Mesosoma in profile with pronotal dorsum convex; promesonotal suture distinctly impressed; mesonotal dorsum convex, elevated above pronotum; metanotal groove indistinct dorsally, laterally evident as very short furrow; propodeum descending posteriorly in stepped outline, armed with pair of more-or-less distinct tuberculae; declivity very steep. Petiole with anterior face straight, posterior face weakly convex; dorsum armed with four acute spines, lateral pair slightly longer and more slender than

dorsal pair. Subpetiolar process angulate anteriorly, widely rounded posteriorly. Anterior face of first gastral segment straight, narrowly rounding onto dorsum of segment.

Mandibles very finely rugose with numerous piliferous pits. Head, mesosoma and gaster shagreened with sides of pronotum and meso- and metapleurae reticulate to reticulate-rugose.

Mandibles with numerous semicrect hairs at masticatory borders and very short appressed hairs arising from pits towards mandibular bases. A few long, anteriorly directed setae on clypeal margin medially and a few very short setae laterally. Two pairs of erect hairs arising near anterior clypeal margin; single pair of medium length, somewhat curved hairs on summit of mesonotum. Gaster with short to medium length, erect hairs lining posterior margins of apical segments, more numerous on ventral surfaces. Whole body densely covered with very short, appressed hairs arising from shallow punctures and pits.

Colour: Black, including proximal half of antennal scapes, coxae and tarsi. Mandibles, condylae, distal half of antennal scapes, funiculi, trochanters, femora, tibiae and apex of gaster dark to very dark reddish-brown. Mandibular masticatory borders and tips of apical funicular segments a shade lighter.

Sexuals and immature stages unknown.

REMARKS. *Polyrhachis undulata* is another species endemic to the Solomon Islands and is known only from the type locality. Nothing is known about its nesting habits. It is relatively similar to *P. emeryana* and *P. pacifica* with distinguishing characters listed under *P. pacifica*.

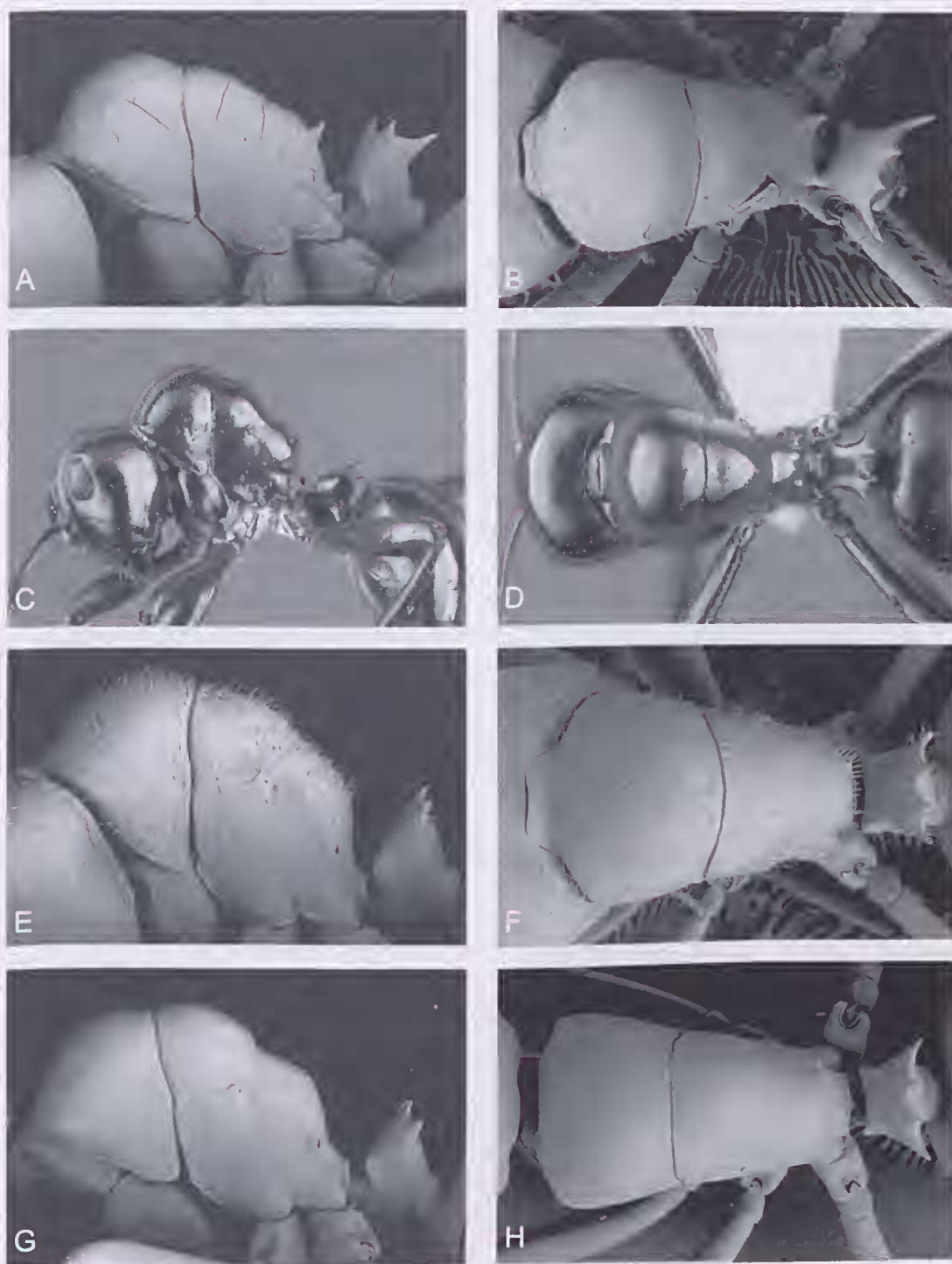


FIG.12. *Polyrhachis* (*Cyrtomyrma*) species from the Solomon Islands, Lateral view of mesosoma and petiole (left); dorsal view of mesosoma and petiole (right). A-B, *P. emeryana* Mann; C-D, *P. pacifica* sp. nov.; E-F, *P. setosa* sp. nov.; G-H, *P. undulata* sp. nov.

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